
A Revision of the Genus *Cineraria* (Asteraceae, Senecioneae)
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A revision of the genus *Cineraria* (Asteraceae, Senecioneae)

Glynis V. Cron¹, Kevin Balkwill¹ & Eric B. Knox²

Summary. A taxonomic revision of the genus *Cineraria* L. (Asteraceae, Senecioneae) is presented. Thirty-five species are recognised, the majority from southern Africa, with *C. deltoidea* occurring throughout the highlands of southern and East Africa, *C. abyssinica* in Ethiopia, Yemen and Saudi Arabia and *C. anampoza* endemic to Madagascar. Two new species, four new subspecies and a new variety are described: *C. magnicephala* Cron from Malawi and *C. ngwenyensis* Cron from Swaziland, *C. alchemilloides* DC. subsp. *namibiensis* Cron from Namibia, *C. lobata* L'Hér. subsp. *platyptera* Cron from the Eastern Cape, *C. lobata* L'Hér. subsp. *lasiocaulis* Cron from the Karoo region of the Northern Cape and Western Cape, *C. lobata* L'Hér. subsp. *soutpansbergensis* Cron from the Soutpansberg centre of endemism and *C. erodioides* DC. var. *tomentosa* Cron from Limpopo Province, South Africa. Two subvarieties of *C. anampoza* have been reduced to forms. Fourteen species have been excluded from the genus. The taxonomic history, morphology, distribution, ecology, uses and conservation status of the genus and species are discussed and dichotomous keys to species and infraspecific taxa are included.

Key words. *Cineraria*, *Compositae*, *Senecioneae*, *Asteraceae*, revision, dichotomous keys.

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Introduction

Cineraria L. of the tribe *Senecioneae* Cass. in the *Asteraceae* comprises mainly perennial herbs and subshrubs with yellow corollas, radiate and calyculate capitula, and palmately-veined leaves that are usually auriculate. The laterally compressed cypselae with distinct margins or wings are important diagnostic characters for the genus. The leaves and stems of many species are grey due to a cobwebby or

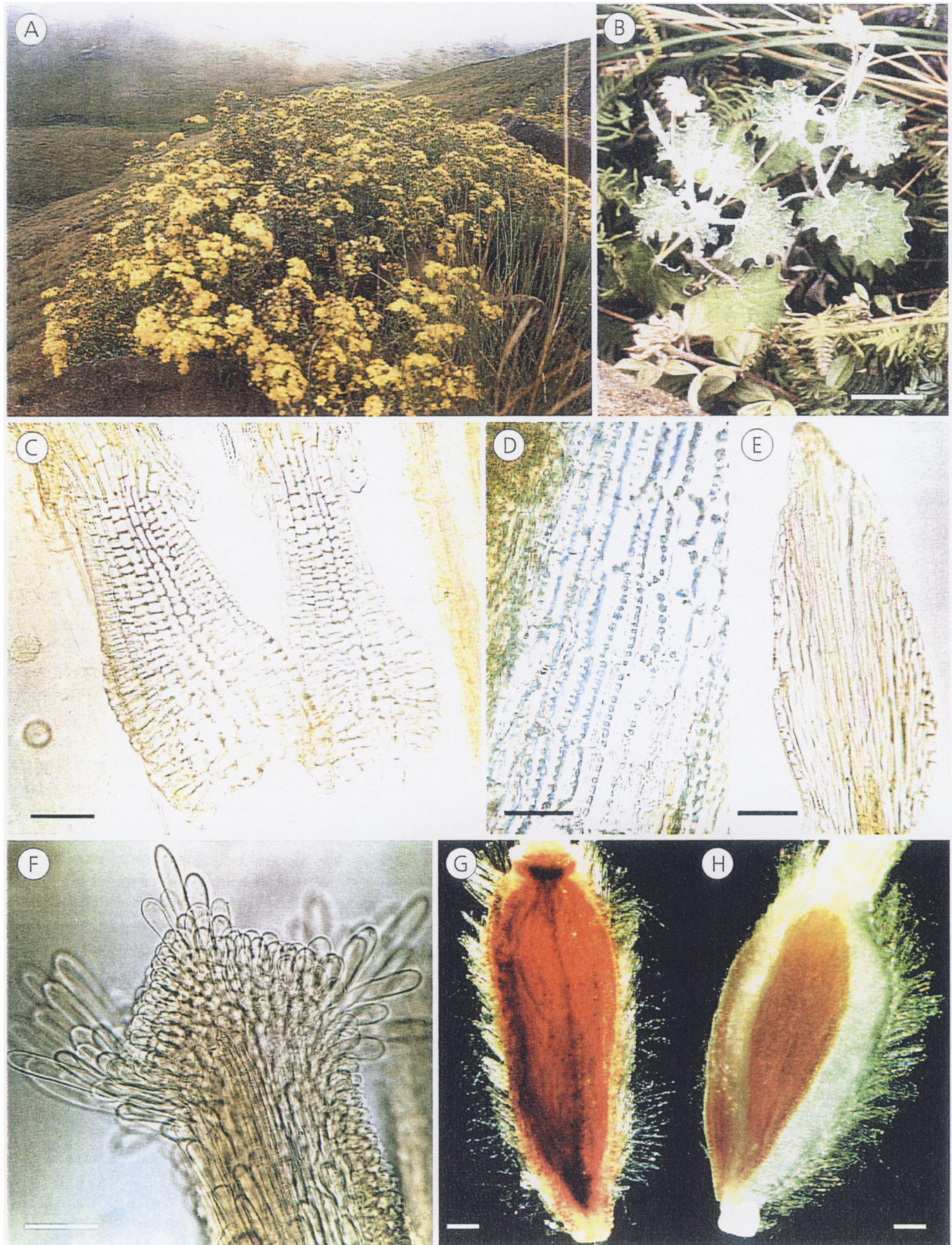
tomentose indumentum, this being the inspiration for the name *Cineraria* (from 'cinereus' meaning ash-coloured). *Cineraria* has balusterform (dilated) filament collars in its stamens, discrete stigmatic areas and a chromosome number of $x = 10$, and is therefore a senecioid member of the subtribe *Senecioninae* (Nordenstam 1978; Bremer 1994). The anthers have an obtuse apical appendage and radial endothelial thickening. The style is obtuse with sweeping hairs surrounding it and commonly on the apex as well. These diagnostic features are illustrated in Fig. 1.

The centre of diversity of *Cineraria* is in southern Africa with 32 of the 35 species recognised occurring here, 27 in South Africa, four in each of Malawi and Lesotho, three in Namibia, Mozambique, Zimbabwe and Zambia, two in Angola and Swaziland and one species in Botswana. *Cineraria deltoidea* Sond. is the only species that occurs throughout the south-eastern and eastern highlands of Africa into Ethiopia. *Cineraria abyssinica* Sch. Bip. ex A. Rich. extends from Ethiopia into Yemen and Saudi Arabia and *C. anampoza* (Baker) Baker is endemic to Madagascar. *Cineraria foliosa* O. Hoffm. is known only from the Kipengere Range in southern Tanzania.

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Cineraria has an afro-montane (to alpine) distribution, although it descends to sea level in parts of the Eastern Cape and Western Cape. It therefore exhibits an 'African track' distribution pattern (Linder *et al.* 1992). *Cineraria* most commonly grows amongst rocks on mountain slopes or at the base of cliffs where it is protected against fire, and usually on the moister southern or south-eastern aspect in the southern hemisphere, but also along forest margins and in grassland.

Cineraria saxifraga DC. is the only species to be widely cultivated and available from commercial nurseries as a garden plant in South Africa, although many of the grey-leaved species would make very attractive garden plants. They are easily grown from seed, but are sensitive to habitat and moisture conditions. Traditional medicinal uses of *Cineraria* are known for only two species: *C. aspera* Thunb. and *C. lyratiformis* Cron, both of which are used by the Southern Sotho for asthma and tuberculosis or for colds and to relieve colic, respectively (Watt & Breyer-Brandwijk 1962).

In this paper we present a taxonomic revision of the genus *Cineraria*, recognising 35 species and discussing their taxonomic history, morphology, distribution, ecology, uses and conservation status. Specimens from BM, BOL, BR, COI, E, EA, G-DC, GRA, J, K, LISC, MO, NBG, NH, NU, P, PRE, PRU, S, SAM, SRGH, TCD, UPS, US, WAG, and Z were examined (acronyms following Holmgren *et al.* 1990). All cited specimens were seen; types seen are indicated (!). A full list of specimens seen is available on the website: www.wits.ac.za/apes/ggoodman/cineraria.html. Current conservation status assessments are provided following IUCN guidelines (IUCN 2001). A dichotomous key to the species and keys to the various infraspecific taxa are included. Two new endemic species are described: *C. magnicephala* Cron from Malawi and *C. ngwenyensis* Cron from Swaziland. In addition, four new subspecies and a new variety are described: *C. alchemilloides* DC. subsp. *namibiensis* Cron from Namibia, *C. lobata* L'Hér. subsp. *platyptera* Cron from the Eastern Cape, *C. lobata* L'Hér. subsp. *lasiocaulis* Cron from the Karoo region of the Northern and Western Cape, *C. lobata* L'Hér. subsp. *soutpansbergensis* Cron from the Soutpansberg centre of endemism and *C. erodioides*

DC. var. *tomentosa* Cron from Limpopo Province, South Africa. The status of two subvarieties of *C. anampoza* has been reduced to forms.

Fourteen species have been excluded from the genus, based on molecular and morphological phylogenetic studies (Cron 2005). All of these species lack the compressed cypselae diagnostic of *Cineraria* and have pinnately-veined leaves, some of which are exauriculate. Some of these excluded species also have ecalyculate capitula and one (*C. exilis* DC.) has discoid capitula. The exclusion of these anomalous species has resulted in a more coherent and phylogenetically valid (i.e. monophyletic) genus.

Taxonomic history

Cineraria L. was first treated in *Species Plantarum* (Linnaeus 1763) and was therefore not formally diagnosed, although *C. geifolia* L. (*Hortus Cliffortus Solidago* 7) is recognised as the type for the genus (Wijnands 1983; Jarvis *et al.* 1993). Harvey (1865: 307) noted that *Cineraria* differs from *Senecio* L. by 'the cone-tipped style and the usually flattened or many-angled achenes'. Hilliard (1977) distinguished it from *Senecio* by its compressed cypselae (at least of the ray florets) in her key to the *Senecioneae*, and Bremer (1994) emphasised the palmate venation of the leaves as diagnostic of the genus.

A large number of species (over 400) have in the past been placed in the genus *Cineraria*, subsequently removed and placed in neighbouring genera (Index Kewensis 1997). Prior to this revision, about 45 species were recognised (Dyer 1975; Hilliard 1977; Nordenstam 1977; Cron 1991), but Jeffrey (1986) suggested the correct number to be between 15 and 20 species and Bremer (1994) estimated the number to be 30.

The genus *Cineraria* has never been treated monographically and has clearly been in need of revision for some time (Hilliard 1977; Jeffrey 1986; Hilliard & Burt 1987; Cron 1991 and Cron & Vincent 1994). It was last treated on a regional level in South Africa by Harvey (1865) and briefly (only two species) by Oliver & Hiern (1877). De Candolle (1838) included 33 species in his treatment of *Cineraria*, but noted that eleven of these were questionable. Harvey's (1865) treatment comprised

Fig. 1 (opposite). Distinguishing features of *Cineraria*: **A** suffrutex: *C. aspera* near the summit of Naudé's Nek in the Eastern Cape, South Africa; **B** perennial herb with grey indumentum: *C. grandibracteata* on Mount Gilboa in the KwaZulu-Natal Midlands, scale bar = 24 mm; **C** minutely sagittate anther bases and balusterform filament collars [*C. deltoidea*: Cron *et al.* 281 (J)], scale bar = 100 µm; **D** radial endothelial thickening of anthers [*C. deltoidea*: Cron *et al.* 281 (J)], scale bar = 50 µm; **E** obtuse anther appendage [*C. canescens*: Leopoldt 3274 (BOL)], scale bar = 100 µm; **F** obtuse/penicillate style apex with sweeping hairs [*C. aspera*: Cron & Goodman 551 (J)], scale bar = 50 µm; **G, H** obovate laterally compressed cypselae, with distinct margins: **G** *C. alchemilloides* [Taylor 2813 (NBG)], or wings: **H** *C. platycarpa* [Laidler 57 (PRE)], either glabrous (not shown) or with trichomes that emit mucilaginous threads on wetting, scale bars: **G** = 200 µm, **H** = 193 µm.

22 species in three sections, including *C. tomentosa* Less. and the dubious species *C. othonnoides* Harv. (previously *Othonna pinnatifida* Thunb.) each in a separate section of their own: *Senecioides* and *Othonnoides* respectively. The remainder of the species were placed in section (*Eu-*) *Cineraria*.

Phylogenetic studies (Cron 2005) have thus far proven inconclusive concerning subgeneric classification, but we have arranged species informally into apparently natural groups based on morphological similarities indicating putative relationships. Important characters denoting species relationships appear to be the arrangement, number and size of capitula (and associated peduncle length), leaf shape and type of indumentum.

Morphology

Habit

Cineraria comprises mainly perennial herbs and shrublets, although the shrublets may appear to be herb-like in their first year of growth. The majority of species are erect, with only a few tending to a prostrate or creeping habit due to a stoloniferous or tuberous stem (e.g. *C. mollis*, *C. vagans*). Certain species appear to be annual or short-lived perennials; in most cases this has not been confirmed by growth studies but interpreted from the degree of woodiness of the stem and field observation.

Leaves

Leaf shape, lobing and the presence and shape of auricles at the base of the petiole are of considerable taxonomic importance in distinguishing species in *Cineraria*, and appear to be good indicators of phylogenetic relationships. However, leaf shape and lobing are sometimes quite variable within a species and even within a single plant. It is important that corresponding leaves are compared, as leaves from the upper part of the stem, the middle and the lower parts may differ. Conveying the differences in lobing and shapes of leaves in words is sometimes difficult (as noted by Hilliard (1977) and reiterated here), so illustrations of a sample of leaves for all species are provided (Figs 5, 7, 11, 14).

Indumentum

The density and persistence of trichomes may vary considerably in certain species of *Cineraria*, but the type of trichome present is generally very useful in distinguishing species. The main types of trichomes present are: glandular trichomes occasionally found on the surface of the leaves and stem (e.g. *C. glandulosa*, Fig. 2A), or more frequently in the angles of the lobes of leaves (Fig. 2B), or short eglandular trichomes that create a pilose indumentum (Figs 2C, D), and long eglandular trichomes creating a woolly or cobwebby tomentum (Figs 2E – H). The length of the trichome and type of base (tapering or non-tapering; granular or agranular) can also be of assistance in differentiating species of *Cineraria*. Fig. 3 illustrates the array of trichomes seen in *Cineraria*.

Synflorescence and capitula

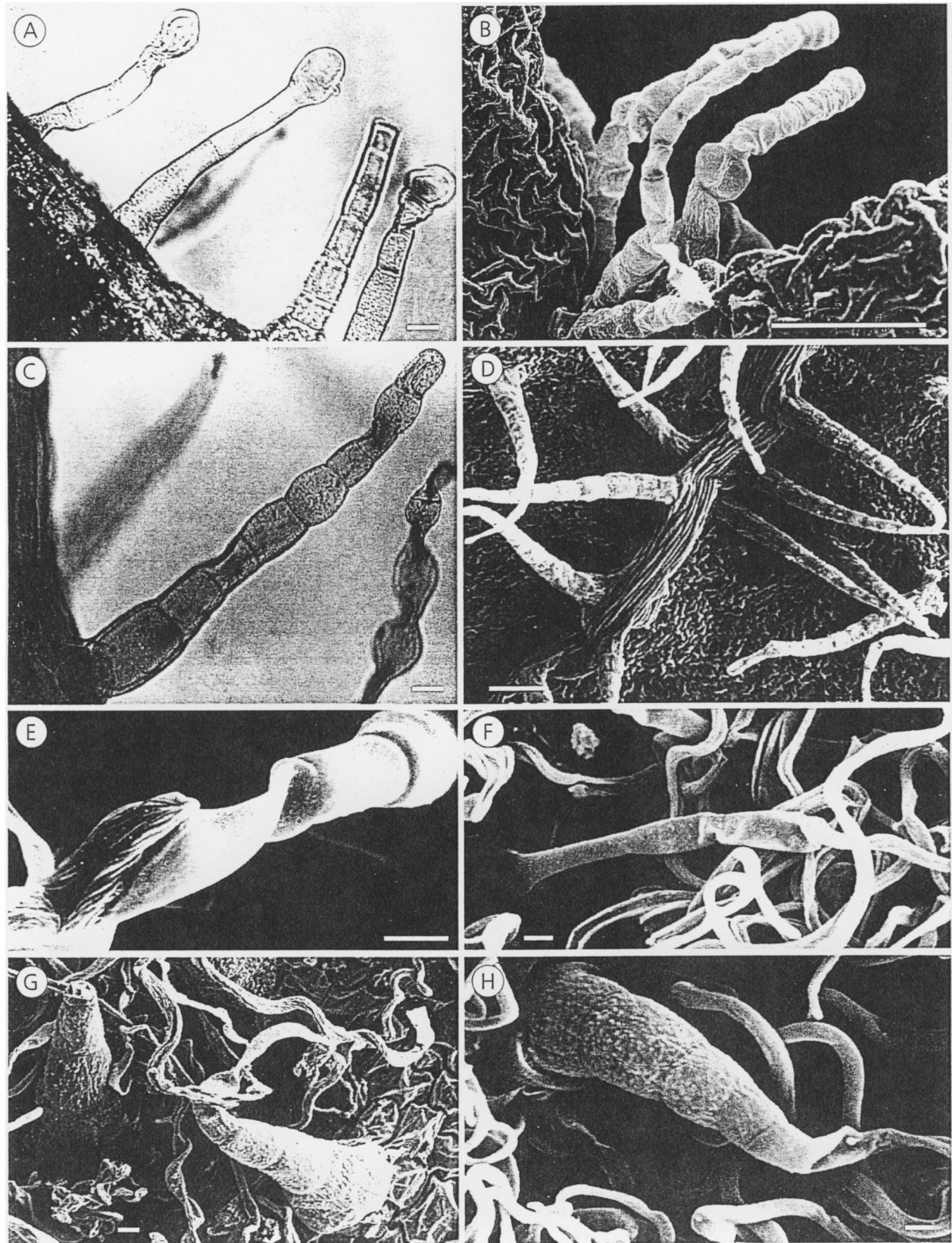
The number of capitula, i.e. whether solitary, few or many, is also useful in distinguishing certain species of *Cineraria*. Solitary (or very few) capitula are generally associated with a herbaceous growth form (e.g. *C. mollis*, *C. grandibracteata* and *C. geraniifolia*). The size of capitula, as indicated by the number of involucre bracts, ray florets and disc florets is also a useful feature in the taxonomy of *Cineraria*. Two broad groups can be distinguished using the number of ray florets (Hilliard 1977), those with 5 rays (to 8) and those with 8 or more rays. The length of ray and disc corollas is useful to a limited degree, only as a confirmatory character for capitulum size.

All species of *Cineraria* have multiserial glandular hairs externally on the tubular base of their ray florets, near the junction with the limb. Also the tips of the corolla lobes of the disc florets are papillate, possibly to serve as additional pollen presenters.

Fruits

As noted previously, the obovate compressed cypselae (Fig. 4A) are an important diagnostic feature for *Cineraria*. They have a well-developed carpodium, commonly with 8 or more rows of cells present, rarely fewer (Fig. 4B). The epicarp is composed of subisodiametric cells, which may be sunken or bulging (described as papillose by some

Fig. 2 (opposite). The main types of trichomes found on the leaves of *Cineraria*. **A** glandular, with 6–8 cells forming stalk and an apical unicellular gland on leaf surface of putative hybrid between *C. glandulosa* and *C. atriplicifolia* [Cron & Scott-Shaw 9 (J)], scale bar = 7 µm; **B** glandular trichomes in angle of lobes of leaf of *C. deltoidea* [Hedberg 1293 (K)], scale bar = 100 µm; **C** eglandular trichome on ventral surface of leaf of *C. geraniifolia* [Cron & Ching 2 (J)], scale bar = 8 µm; **D** eglandular trichomes on ventral surface of leaf of *C. geifolia* [Cron 314 (J)], scale bar = 100 µm; **E** detail of 2–4-celled base of fine trichome with oblique junction with apical appendage, on ventral surface of leaf of *C. albicans* [Cron 3 (J)], scale bar = 10 µm; **F** fine trichome with 4–6-celled base and long apical appendage (joined non-obliquely) on ventral surface of leaf of *C. pulchra* [Cron & Balkwill 499 (J)], scale bar = 10 µm; **G** trichomes with c. 6 cells forming a tapering base (granular) on the dorsal surface of leaf of *C. mazoensis* var. *graniticola* [Mahohoma 31 (K)], scale bar = 10 µm; **H** tapering, granular base of trichome on dorsal surface of leaf of *C. austrotransvaalensis* [Cron 19 (J)], scale bar = 10 µm.



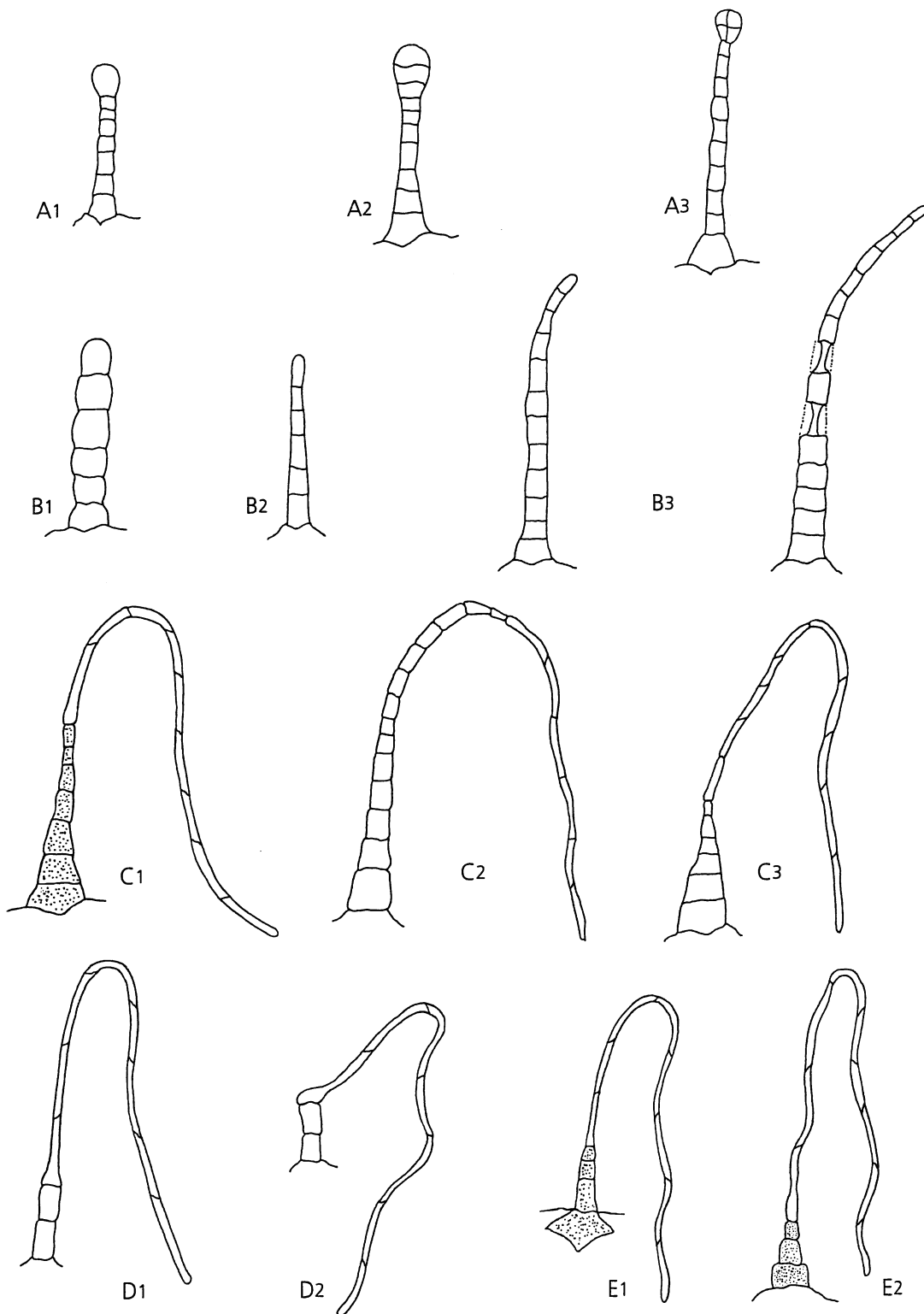


Fig. 3. Trichomes types in *Cineraria*. **A** glandular trichomes: **A1** uniseriate with unicellular apical gland; **A2**, **A3** uniseriate with multicellular glands; **B** short eglandular trichomes: **B1** 6–8 cells, not tapering, with rounded apical cell; **B2** 6–8(–10) cells, tapering; **B3** 12–16 cells, broadly tapering, cells may collapse in alternate directions when dry; **C** long woolly trichomes with multi-celled tapering bases and multi-celled apical appendages: **C1** 4–6 basal cells, granular; **C2** multi-celled, gradually tapering, agranular; **C3** 4–6 basal cells, agranular; **D** long woolly trichomes with narrow agranular basal cells and long multi-celled apical appendage: **D1** apical appendage joined non-obliquely to 2–4 basal cells; **D2** apical appendage attached obliquely to 2–4 basal cells; **E** long woolly trichomes with narrow granular basal cells and long multi-celled apical appendage: **E1** basal cell appressed to leaf surface subsequent cells of similar size; **E2** 2–3 granular basal cells, decreasing in size towards apex, first cell not appressed to leaf surface.

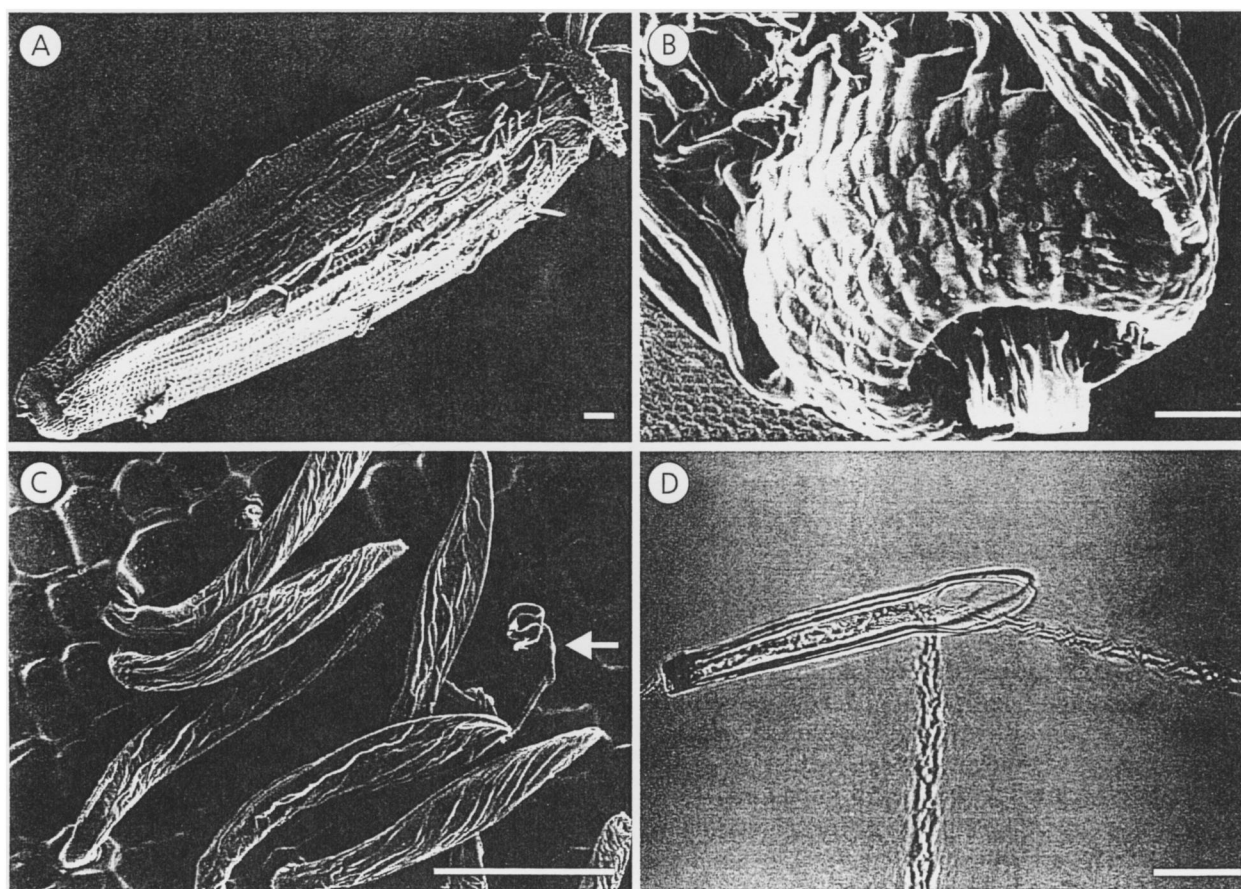


Fig. 4. Features of the cypselae of *Cineraria*: **A** SEM of obovate, laterally compressed, margined cypselus of *C. pinnata* [Moura *et al.* 361 (WAG)], scale bar = 100 μ m; **B** carpodium at base of cypselus of *C. mazoensis* var. *graniticola* [Cron & Balkwill 532 (J)], scale bar = 10 μ m; **C** cypselus epicarp of *C. canescens* [Levyns 4044 (BOL)] with subsodiametric cells and duplex trichome, arrow indicates released mucilaginous thread, scale bar = 100 μ m; **D** light micrograph of duplex trichome of *C. alchemilloides* subsp. *namibiensis* [Merxmüller & Gies 3558 (BR)] with mucilaginous threads released, scale bar = 50 μ m.

authors of species descriptions), with a smooth or patterned surface (Fig. 4C). In most species the cypselae are either glabrous or ciliate on the margins and/or the faces, although occasionally a few hairs may be present on the shoulders of normally glabrous cypselae (e.g. in *C. lyratiformis*). These are duplex trichomes and emit mucilaginous threads upon wetting (Fig. 4C, D). The lateral extension of the cypselus is also a useful diagnostic feature for most species. However, cypselae often appear narrow-winged when immature, but are clearly margined once the cypselus has matured and filled out. Cypselae of many other genera in the Senecioneae also appear to be compressed when young, resulting in their having erroneously been placed in *Cineraria*.

Conservation status

The conservation status (according to the IUCN 2001 criteria) for the species of *Cineraria* occurring in

South Africa have been submitted to the Red List Authority (J. E. Victor) and have been evaluated and accepted. The 'Orange List' referred to is a concept that has been developed in South Africa as a 'way of recording the conservation importance of taxa that are rare and of special concern but not on a Red List' (Victor & Keith 2004).

Taxonomic treatment

Cineraria L. (1763: 1242); (1764: 426); DC. (1838: 305 – 313); Harv. (1865: 307 – 314); Benth. & Hook. f. (1873: 443); Oliv. & Hiern (1877: 404); Merxmüller (1967: 41 – 42); R. A. Dyer (1975: 713 – 714); Compton (1976: 648); Hilliard (1977: 372); Lisowski (1991: 434); Bremer (1994: 499). Type: *Cineraria geifolia* (L.) L.

Xenocarpus Cass. (1829: 108 – 110), *synon. fide* Benth. & Hook. f. (1873: 445). Type: *Xenocarpus geifolius* Cass. (= *Cineraria geifolia* (L.) L.).

Herbs and subshrubs. *Stems* slender to robust, usually erect, occasionally stoloniferous, often woody near the base. *Leaves* alternate, 5–7-lobed, palmately-veined, typically deltoid or reniform, occasionally pinnatifid, glabrous or more usually hairy, usually coarsely dentate, petiolate, commonly auriculate. *Capitula* heterogamous, radiate, ray florets functionally female, disc florets bisexual; *involucre* campanulate, uniseriate, margins of bracts scarious, with few calyculus bracts; *receptacle* flat, epaleate. *Corollas* bright yellow; corolla of ray florets strap-shaped, patent; limb narrowly elliptic to oblanceolate, 3-toothed, sparsely villous at base with biseriate glandular hairs; corolla of disc florets

tubular, dilated above, shortly 5-lobed; each lobe with a distinct median vein running down the tube, apices of lobes papillose; *anthers* with obtuse apical appendages, radial endothelial thickening; bases minutely sagittate; filament collars balusterform; *style* branches of ray florets truncate, of disc florets penicillate/obtuse, with sweeping hairs peripherally and usually also centrally on apex; stigmatic surfaces discrete. *Cypselae* obovate, compressed, brown (to black), distinctly margined or winged, glabrous or ciliate with duplex trichomes that secrete mucilage when moistened; carpodium distinct; pappus of delicate scabrid white setae, caducous.

Key to the species of *Cineraria*

1. Cypselae glabrous 2
Cypselae ciliate on margins and/or hairy on faces 16
2. Leaves lyrate-pinnatifid or lyratiform (Fig. 5A, B) 3
Leaves deltoid (Fig. 5C–E) to deltoid-reniform (Fig. 5H) or reniform (Fig. 5G, J1, J3),
not lyratiform (excluding uppermost, bract-like leaves) 4
3. Cypselae broad-winged (especially the rays; wings about equalling the body of the cypselae); ray
florets not reduced (limb >3.5 mm long) 1. *C. lyratiformis*
Cypselae not broad-winged; ray florets very reduced, limb ≤3.5 mm long 2. *C. abyssinica*
4. Upper leaves distinctly deltoid; lower leaves may be deltoid or deltoid-reniform 5
Upper leaves deltoid-reniform or reniform; lower leaves distinctly reniform 7
5. Leaves distinctly discoloured, green above, thickly white or grey tomentose (felted) below;
involucral bracts usually cobwebby; from southern Angola 6. *C. huilensis*
Leaves green above and below, or green above, grey cobwebby below; involucral bracts
glabrous (although calyculus bracts may be cobwebby); not from southern Angola 6
6. Apical lobe a half to two-thirds of the length of the leaf (especially in the upper leaves);
auricles lanceolate, usually small 3. *C. atriplicifolia*
Apical lobe less than half the length of the leaf; auricles auriform, often conspicuous 4. *C. deltoidea*
7. Capitula solitary or in twos or threes on long terminal peduncles (usually longer than 60 mm) 8
Capitula few (3 or 4) or many on shorter terminal peduncles (usually shorter than 60 mm) 11
8. Leaves grey due to a cobwebby or woolly indumentum; bracts on peduncles large (7–20 mm
long) 8. *C. grandibracteata*
Leaves green, glabrous or with short glandular hairs (mainly on veins on ventral surface of
leaves); bracts usually small (≤4 mm long), rarely as long as 10 mm 9
9. Leaves deltoid-reniform to reniform (Fig. 7B), usually with cuneate to truncate bases,
glabrous 11. *C. longipes*
Leaves reniform with subcordate to cordate bases (Fig. 7C2, D), rarely glabrous, usually with some hairs on
ventral surface, especially on veins 10
10. Auricles present, auriform; usually 8–13 rays (rarely as few as 5); leaves usually distinctly
lobed; veins in disc corolla usually reddish brown 12. *C. geraniifolia*
Auricles absent or reduced to slight widening of petiole base; 5–8 rays; leaves very shallowly
lobed; veins in disc corolla usually pale yellow 13. *C. vagans*
11. Peduncles glabrous 12
Peduncles cobwebby or sparsely hairy, usually glabrescent 14
12. Ray limbs 4.5 mm or less; from Madagascar 15. *C. anampoza* f. *hygrophila*
Ray limbs 5 mm long or usually longer; not from Madagascar 13
13. Leaves glabrous below, base cuneate to truncate to subcordate 11. *C. longipes*
Leaves sparsely hairy to hairy below, base subcordate to cordate 12. *C. geraniifolia*

14. Leaf auricles inconspicuous, ovate to lanceolate, not toothed 29. *C. ngwenyensis*
 Leaf auricles usually conspicuous, auriform, lobed and/or toothed 15
15. Suffrutex; leaves deltoid-reniform or reniform with 5 – 7 rounded lobes (Figs 7G, 9B),
 coarsely dentate margins; auricles usually procurrent (extending along petiole) ... 16. *C. erodioides*
 Slender herb (single-stemmed); leaves sagittate to reniform in outline with 3 – 5 acute
 lobes (Fig. 7E), margins not coarsely dentate; auricles not procurrent 14. *C. dryogeton*
16. (1) Leaves white, grey or greyish-green due to a cobwebby or woolly indumentum 17
 Leaves green, glabrous or hairy (but not cobwebby) 37
17. Capitula solitary or occasionally in twos or threes on long peduncles (longer than 65 mm);
 caespitose habit with contracted internodes 7. *C. mollis*
 Capitula few (3 or 4) or many, on relatively short peduncles (usually less than 65 mm);
 erect herbs or shrublets, internodes not contracted 18
18. Cypselae broad-winged (either both ray and disc cypselae, or ray cypselae only) 19
 Cypselae margined to narrow-winged 20
19. Leaves ovate to deltoid-reniform in outline, or lyrate-pinnatifid; upper leaves usually with
 many lateral pinnae below lamina (Fig. 7J) 18. *C. vallis-pacis*
 Leaves deltoid-reniform to reniform in outline; uppermost leaves without lateral pinnae
 below lamina, or one pair only (Fig. 7G) 16. *C. erodioides*
20. Leaves pinnatisect with ovate to elliptic outline (Fig. 11A, B) 21
 Leaves deltoid, deltoid-reniform or reniform in outline, and **not** pinnatisect 22
21. Lobes and pinnules of leaves dentate; auricles auriform, coarsely dentate 19. *C. aspera*
 Lobes and pinnules of leaves entire; auricles linear 20. *C. cyanomontana*
22. Auricles usually conspicuous, procurrent 16. *C. erodioides*
 Auricles not usually conspicuous, not procurrent 23
23. Leaves strikingly discolorous, green above, tomentose white or grey below, deltoid with
 shallow lobing; from southern Angola 6. *C. huilensis*
 Leaves usually not strikingly discolorous, if so then deltoid-reniform with very deep lobing;
 not from Angola 24
24. 3 – 8 rays, never more than 8 25
 8 – 13 rays, occasionally more than 13 34
25. Involucral bracts tomentose, cobwebby or cobwebby glabrescent 26
 Involucral bracts glabrous (but calyculus bracts may be cobwebby) 29
26. Rays 7 or 8; involucral bracts 12 or 13 23. *C. mazoensis* var. *mazoensis*
 Rays 3 – 5, rarely 6; involucral bracts 8 or fewer 27
27. Leaves deltoid to deltoid-reniform, lobes not distinctly further divided (Fig. 14B), thinly
 cobwebby 27. *C. alchemilloides* subsp. *alchemilloides*
 Leaves reniform to deltoid reniform, lobes usually further divided (Figs 11C, D, 12A, E),
 usually thickly cobwebby to tomentose 28
28. Fine leaf trichomes with narrow bases (Fig. 12B – D), or broader and gradually tapering, with
 a long apical appendage (but not with sharply tapering basal cells) 21. *C. canescens* var. *canescens*
 Leaf trichomes with 4 – 7 sharply tapering basal cells and long apical appendage (Fig. 12F
 – H) 22. *C. erosa*
29. Leaves reniform in outline, lobes shallow (main apical lobe less than a third of length of
 lamina, Fig. 11C3) 21. *C. canescens* var. *flabellifolia*
 Leaves deltoid or deltoid-reniform in outline, lobes distinct to deep (main apical lobe a
 third or more of lamina length) 30
30. Leaves deltoid-reniform in outline, distinctly lobed with deep rounded sinuses between
 lobes (Fig. 11E, F) 31
 Leaves deltoid (occasionally deltoid-reniform) in outline, may be distinctly lobed but
 without rounded sinuses between lobes 32
31. Leaves cobwebby above, tomentose or cobwebby below; larger capitula (7 or 8 rays; 25 – 40
 disc florets) 23. *C. mazoensis*
 Leaves glabrous above, thinly cobwebby below; smaller capitula (5 – 7 rays; c. 20 disc florets) ... 24. *C. foliosa*
32. Auricles lanceolate 28. *C. lobata* subsp. *soutpansbergensis*
 Auricles auriform, occasionally reduced to widening of petiole base 33
33. Leaves deltoid to deltoid-reniform, distinctly lobed; from Namibia (or Northern Cape)
 27. *C. alchemilloides* subsp. *namibiensis*

- Leaves deltoid to deltoid-reniform, shallowly lobed; not from Namibia or the Northern Cape **4. C. deltoidea**
- 34(24) Large capitula with 12 – 17 involucre bracts, 12 – 16 ray florets and about 70 disc florets **26. C. magnicephala**
- Capitula of medium size with 13 or fewer involucre bracts, 8 – 13 rays and between 25 and 60 disc florets 35
35. Leaves dentate lobulate, deeply lobed with rounded sinuses between lobes, frequently with lateral pinnae along length of petiole (Fig. 11G); veins prominent on ventral surface of leaves **25. C. pulchra**
- Leaves deltoid to deltoid-reniform to rounded (not dentate lobulate) and relatively shallowly lobed without deep rounded sinuses between lobes, one or two lateral pinnae sometimes present (Figs 5J, 7A); veins not very prominent on ventral surface 36
36. Margins of leaves slightly dentate; capitula in simple lax corymbs (never compound); fine trichomes with 2 – 4 narrow agranular basal cells and long apical appendage (Fig. 3D) on leaf surfaces **9. C. albicans**
- Margins of leaves extremely dentate; capitula frequently in compound corymbs (rarely simple); trichomes on leaves have multi-celled, tapering granular base and long apical appendage (Fig. 3C1, E1) **10. C. austrotransvaalensis**
- 37(16) Uppermost and lower leaves deltoid to deltoid-reniform or reniform, lamina not lyrate-pinnatifid or pinnatisect, occasionally with one or two lateral pinnae below lamina 38
- Uppermost leaves lyrate-pinnatifid/pinnatisect (Fig. 14J1, K), middle to lower leaves similar or deltoid to deltoid-reniform to reniform, usually with lateral pinnae below lamina 48
38. Upper leaves distinctly deltoid; lower leaves deltoid to deltoid-reniform 39
- Upper leaves deltoid-reniform or reniform; lower leaves distinctly reniform 40
39. Leaves glabrous above and below or sparsely hairy below mainly on veins (trichomes short eglandular trichomes, Fig. 3B2); auricles lanceolate **5. C. decipiens**
- Leaves usually sparsely hairy (trichomes commonly with tapering, multi-celled base and long apical appendage, Fig. 3C); auricles auriform **4. C. deltoidea**
40. Leaves (and sometimes stems) covered with glandular hairs **17. C. glandulosa**
- Leaves and stems not covered with glandular hairs 41
41. Involucre bracts hairy (with short eglandular hairs) or cobwebby, glabrescent 42
- Involucre bracts glabrous 45
42. Involucre bracts cobwebby, usually glabrescent (at least cobwebby at base and amongst calyculus bracts) **16. C. erodioides**
- Involucre bracts hairy (not cobwebby) 43
43. Capitula small; 5 or fewer rays; 7 or 8 involucre bracts, no longer than 4 mm long; c. 20 disc florets **28a. C. lobata** subsp. **lobata** (hairy form)
- Capitula of medium size; usually 7 or 8 rays; 8 – 13 involucre bracts, 4 – 6 mm long; more than 20 disc florets 44
44. Trichomes 12 – 14 cells long, distinctly tapering and spreading hairs (Fig. 3B3); capitula few (3 – 6) to many per stem; auricles usually conspicuous **31. C. geifolia**
- Trichomes 6 – 8 cells long, not tapering, with rounded apical cell (Fig. 3B1); capitula solitary or in twos and threes; auricles inconspicuous or absent **32. C. angulosa**
45. Leaves exauriculate and slightly succulent, with distinctly cuneate to truncate bases **30. C. saxifraga**
- Leaves auriculate and not succulent, with truncate, subcordate or cordate bases 46
46. Leaves deltoid to deltoid-reniform in outline, distinctly lobed **28. C. lobata**
- Leaves mainly reniform in outline, usually shallowly lobed 47
47. Smaller capitula with 30 or fewer disc florets; limb of ray florets no longer than 4.5 mm; from Madagascar **15. C. anampoza**
- Larger capitula usually with 30 or more disc florets; limb of ray florets longer than 4.5 mm; from the Western Cape, South Africa **31. C. geifolia**
- 48(37) Annual herb less than 30 cm tall, cypselae broad-winged and fringed with hairs (then dark brown), or margined, black, 2.5 – 3.0 mm long **33. C. platycarpa**
- Annual herb usually 40 – 60 cm tall, cypselae margined (not winged), brown, 2.0 – 2.5 mm long 49
49. Middle to lower leaves deltoid to deltoid-reniform, with papery-thin texture when dry; grows in coastal grassland or wetlands **34. C. pinnata**
- Middle to lower leaves reniform, not papery-thin when dry; grows inland in grassland **35. C. parvifolia**

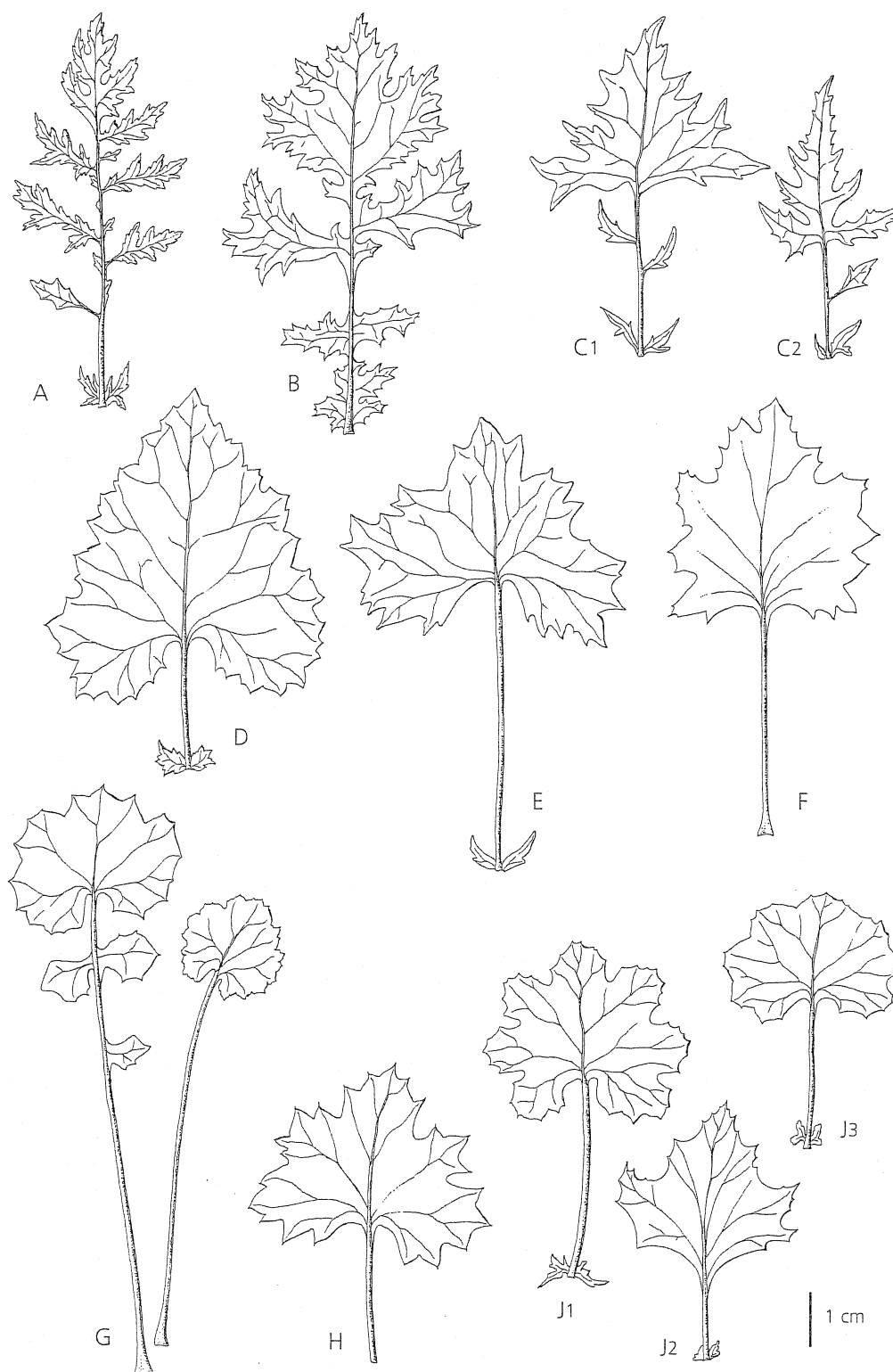


Fig. 5. Leaves of *Cineraria*: **A** *C. lyratiformis* [Cron & Balkwill 459 (J)]; **B** *C. abyssinica* [Hepper 5641 (K)]; **C** *C. atriplicifolia* [**C1**: J. M. Wood 515 (K); **C2**: Cron 7 (J)]; **D** *C. deltoidea* [Cron & Scott-Shaw 11 (J)]; **E** *C. decipiens* [Cron & Brummer 5a (J)]; **F** *C. huilensis* [Borges 89 (BR), isotype]; **G** *C. mollis* [Cron & Goodman 542 (J)]; **H** *C. grandibracteata* [Cron & Scott-Shaw 10 (J)]; **J** *C. albicans* [**J1**: Balkwill & Balkwill 5414 (J); **J2**, **J3**: Hort. Kew, holotype]. DRAWN BY SANDY BURROWS.

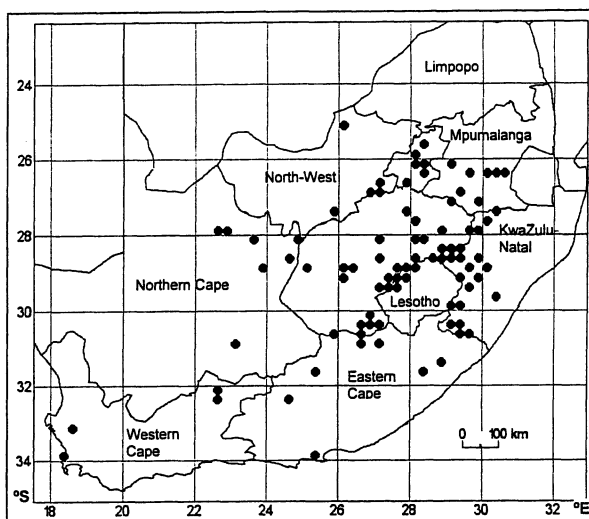
1. *Cineraria lyratiformis* Cron in Cron & Balkwill (1999: 287). Type: South Africa, Cape, Nieuweveld, between Beaufort and Rhinosterkop, 795–950 m (2500–3000'), *Drège* 711 (holotype G-DC!; isotype P!). *C. lyrata* DC. (1838: 308); Harv. in Harvey & Sonder (1865: 313); Hilliard (1977: 375); Henderson & Anderson (1966: 346–347), *nom. illeg.*; non *C. lyrata* Ledeb. (1818: 576). Type: as above.

Annual or possibly short-lived perennial herb, up to 60 cm tall. *Stems* herbaceous, but may be woody basally, unbranched or branching near the base, cobwebby, glabrescent, lined, green flushed reddish when young. *Leaves* reniform with pinnae in young seedlings passing to lyrate-pinnatifid in mature plants, usually with 2–3 pairs of lateral lobes, terminal lobe often the largest; lamina up to 80 × 30 mm, cobwebby when young, glabrescent once mature, lower surface usually remaining sparsely cobwebby or hairy, mainly on the veins; apex of lobes acute; margins dentate; base cuneate to truncate to subcordate, upper leaves sometimes sessile and clasping; petiole 1–30 mm long, cobwebby, glabrescent; auricles varying in size, often conspicuous, auriform, but dissected and dentate. *Capitula* heterogamous, radiate, few (4–12) to many (<80) per stem arranged in lax or compact corymbose panicle; peduncles 2–30 mm long, cobwebby, glabrescent, bracteate. *Involucre* calyculate; phyllaries 12–14(–18), 4–5 mm long, glabrescent, but remaining cobwebby at base amongst calyculus bracts; margins scarious. *Ray florets* usually 7 or 8 (rarely 9–14), 5–8 mm long; limb 3.5–6.0 mm long, 4(–6)-veined. *Disc florets* 32–40(–62), corolla 3–4 mm long. *Cypselae* broadly obovate, compressed, broadly winged, black or dark brown with pale brown wings, 2.0–2.5 mm long with wings 0.5–0.8 mm wide, glabrous or sparsely ciliate at tops of wings and/or sparsely hairy on faces. *Pappus* as long as corolla of disc florets. Fig. 5A.

PHENOLOGY. Flowering between October and April, rarely in May and August.

ILLUSTRATION. Henderson & Anderson (1966: Fig. 2).

DISTRIBUTION. Lesotho and South Africa, ranging from Postmasberg and Warrenton in the Northern Cape to the Free State, KwaZulu-Natal and the Eastern Cape, as well as Standerton and Lake Chrissie in Mpumalanga, Bronkhorstspuit (Pretoria District) in Gauteng, Klerksdorp and Potchefstroom in the



Map 1. Known distribution of *Cineraria lyratiformis*.

North-West and the region near Beaufort West in the Western Cape (Map 1).

SELECTED COLLECTIONS. LESOTHO: Teyateyaneng, 7 Feb. 1958, *Lawson* 864 (NH); Mamathes, 12 Jan. 1941, *Moffatt* 28 (NH); Maseru, *Williamson* 6 (K); Maseru, 25 Jan. 1951, *Compton* 22545 (NBG); Roma Distr., *Ruch* 1685 (PRE); Roma, *Schmitz* 6470 (PRE); Maseru, Rapa-la-Boea, *Backéus* 2173 (UPS); Sehlabathebe National Park, April 1979, *Hoener* 2217 (NU, PRE, S); Hlotse (Leribe), *Mrs A. Dieterlen* 93 (P, PRE). **SOUTH AFRICA:** North-West Province: Renovaal, *Botha & Ubbink* 1030 (PRE); Dam wall near Botanic Garden, Potchefstroom University, 26 Oct. 1976, *Ubbink* 454 (PRE); Banks of Vaal R., 24 Dec. 1944, *Louw* 1365 (PRE); Gauteng: Vereeniging, Nov. 1911, *Leendertz* 3850 (PRE); Magaliesbergpoort-Wonderboom, 10 April 1973, *Vermooten* 24 (PRU); Midrand, pan c. 800 m NE of Glen Austin Bird Sanctuary, 4 Feb. 1999, *de Castro & Brits* 138 (J); Edenvale, Eastleigh, *Reddy, Reddy & Reddy* 2121 (J); Nigel, Langseekoegat, 16 March 1994, *Smit* 2882 (PRU); Mpumalanga: Nooitgedacht, 7 Dec. 1927, *Potter* 1737 (PRE); Standerton, Jan. 1912, *Leendertz* 4076 (BOL, PRE); Lake Chrissie, c. 1 km from N riverbank, April 1975, *Pienaar* 559 (PRE); Knock Dhu Farm, near Lothair, 13 km S of Lake Chrissie, 9 Jan. 1984, *Welman* 379 (K, PRE); Northern Cape: Postmasburg, 2 miles S of Olifantshoek, 26 Aug. 1961, *Leistner & Joynt* 2732 (K, PRE, S); Daniel's Kuil, Barkly West, April 1940,

Fig. 6 (opposite). **A** caespitose habit and reniform leaves of *Cineraria mollis* at Naudé's Nek, Eastern Cape, scale bar = 12 mm; **B** solitary capitula and long peduncles of *C. mollis* [*Bayliss* BS Lesotho 012 (MO)], scale bar = 20 mm; **C** solitary capitula and large bracts are diagnostic for *C. grandibracteata* [*Hilliard & Burt* 10327 (PRE)], scale bar = 30 mm; **D** type specimen of *C. austrotransvaalensis* [*Cron* 19 (J)] with deltoid-reniform to reniform leaves and many capitula, scale bar = 35 mm, inset showing detail of leaf with extremely dentate margins, scale bar = 4 mm.

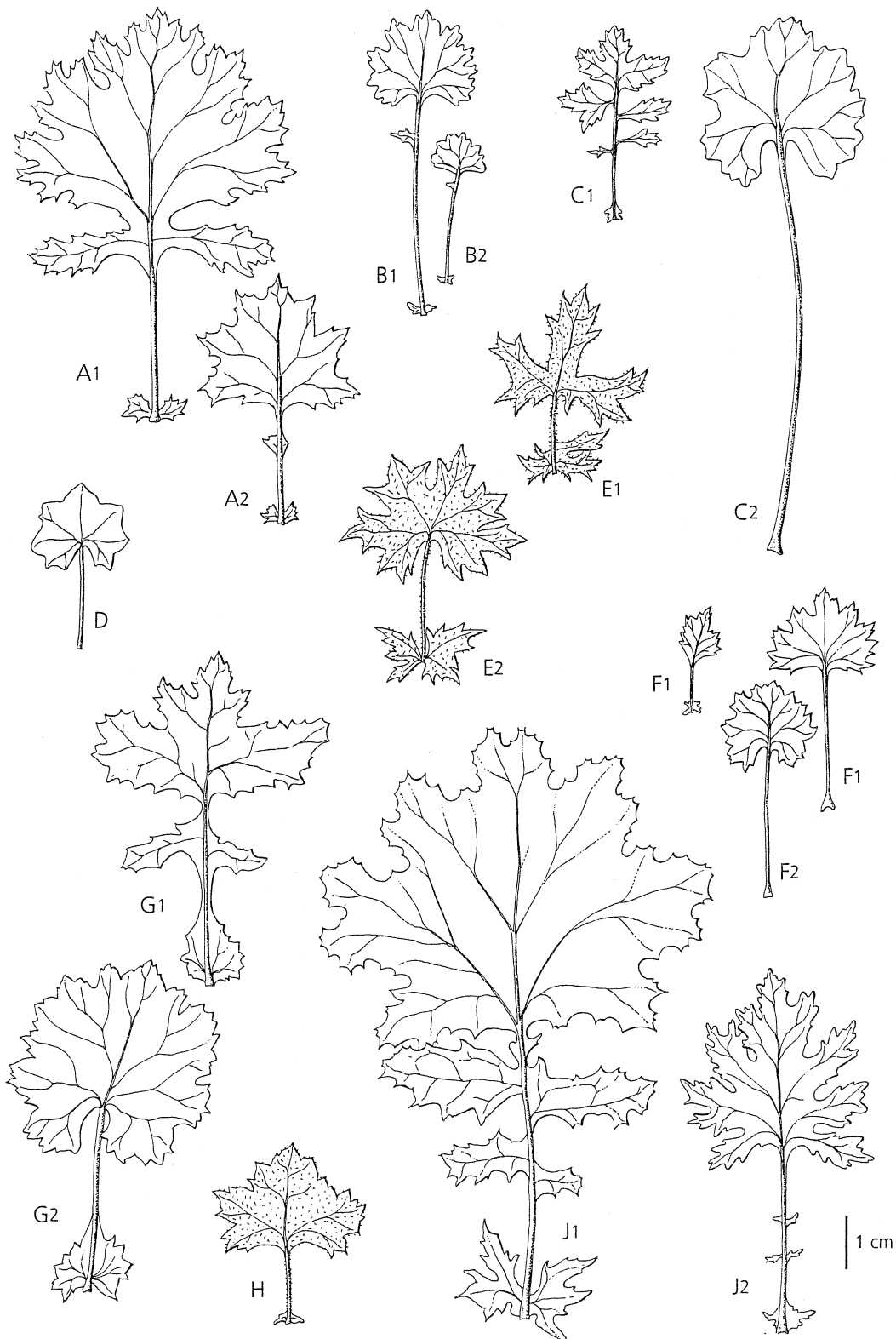


Fig. 7. Leaves of *Cineraria*: **A** *C. austrotransvaalensis* [A1: Hankey 391 (J); A2: Cron 18 (J)]. **B** *C. longipes* [B1: Cron & Balkwill 306 (J); B2: Bryant D94 (J)]. **C** *C. geraniifolia*. C1 upper leaf [Hilliard & Burtt 9739 (MO)]; C2 lower leaf [Johnson 1261 (GRA)]. **D** *C. vagans* [Hilliard & Burtt 18873 (NU)]. **E** *C. dryogeton*. E1 upper leaf; E2 lower leaf [Abbott 7809 (J)]. **F** *C. anampoza*. F1 upper leaf on LHS, lower leaf RHS [Phillipson 1604 (WAG)]; F2 lower leaf [Baron 2113 (K)]. **G** *C. erodioides*. G1 upper leaf; G2 lower leaf [Hilliard & Burtt 6727 (NU)]. **H** *C. glandulosa* [Cron & Goodman 586 (J)]. **J** *C. vallis-pacis* [J1 Balkwill et al. 11802 (J); J2 Dinter 7989 (PRE) isotype]. DRAWN BY SANDIE BURROWS.

Esterhuysen 2027 (BOL, PRE); Kalkdrift, Kimberley, Feb. 1947, *Breuckner* 810 (PRE); Kimberley, Riverton, Nov. 1936, *Esterhuysen* 4064 (BOL, K); Modder R., near Kimberley, Nov./Dec. 1982, *Flanagan* 1415 (BM, BOL, NBG, PRE); Krugersdriftdam, *Muller* 1796 (PRE); 40 km S of Britstown on road to Victoria-West, near Rooipoort, *Ubbink* 668 (PRE); Free State: Heilbron, 3 April 1991, *Fuls* 74 (PRE, PRU); Warden, 12 Feb. 1992, *Fuls* 122 (PRE, PRU); Vrede Distr., Farm Uitsien, 5 km W of Ascent, 19 March 1991, *Eckhardt* 38 (PRU); Amersfoort Distr., Jan. 1961, *Sidley* 3506 (PRE, US); Gansfontein, Ficksburg, 24 Oct. 1934, *Galpin* 13916 (BOL, PRE), Senekal, Doornkop, *Goosens* 793 (PRE); Bethlehem, on Brighton road, Feb. 1940, *Collett* 531 (K, PRE, US); Bestersvlei, Witzieshoek, Dec. 1893, *Bolus* 8192 (BOL, K, PRE); Golden Gate, 19 Feb. 1977, *Steyn* 30 (PRE); Ladybrand Distr., Thaba Phatshwa, Tweespruit, *Cornell* 860 (J); KwaZulu-Natal: Newcastle Distr., bottom of Muller's Pass, 19 Dec. 1963, *Hilliard* 2330 (COI, NU, S); NW of Utrecht, on Farm Schurwekopje 388, 30 Jan. 1998, *Cron & Balkwill* 459 (C, E, J, K, MO); Wapad NW of Van Reenen, 26 Feb. 1981, *Jacobsz* 1729 (NBG, PRE); Bergville Distr., Oliviershoek Pass, 19 Feb. 1970, *Hilliard* 4946 (COI, K, NH, NU, S); Colenso, 26 Feb. 1895, *Schlechter* 6879 (BOL); Weenen County, Rensburg Spruit, 22 Oct. 1944, *Acocks* 10705 (NH, PRE); Cathedral Peak Forest Research Station, 27 Oct. 1973, *Hilliard & Burtt* 6937 (K, NU, PRE, S); Tabamhlope Research Station, Estcourt, 30 March 1938, *West* 749 (K, P, PRE); 8 Oct. 1937, Estcourt, Bushman's River banks, *West* 378 (K, PRE); Mooi R., 25 Oct. 1888, *Medley Wood* 4047 (BOL, NH, K, US); Eastern Cape: Near Aliwal North, Dec. 1892, *Flanagan* 1526 (BOL, PRE); Aasvoëlberg, near Zastron, 18 Dec. 1991, *Peyper* 1145 (PRU); Lady Grey Distr., Farm 'De Kraal', 9 Feb. 1986, *Welman* 752 (BM, PRE); Mt Currie Distr., between Franklin and Swartberg, 21 Nov. 1973, *Hilliard & Burtt* 7383 (NU); Kokstad, Griqualand East, Nov., *Tyson* 1212 (SAM); Alfred Distr., main Weza – Cape road, 15 Jan. 1975, *Hilliard & Burtt* 7719 (K, NU); Eastern Cape: Middelburg Distr., Conway farm, Aug. 1899, *Gilfillan* 5545 (K, PRE); Maclear Distr., Tsitsa footpath, Drakensberg, 5 March 1904, *Galpin* 6711 (PRE); Transkei, Baziya Mt, Mpolampo Valley, 11 Feb. 1981, *Hilliard & Burtt* 13936 (NU); Western Cape: Klaversvlei, Beaufort West, *Niewoudt* 16 (NU); Nieweveld, between Beaufort and Rhinosterkop, *Drège* 711 (holotype G-DC, isotype P); Graaff-Reinet, March, *Bolus* 98 (K, S); Oshoekkop N of Moorreesburg, 20 Feb. 1951, *Van Zyl* 3305 (K, PRE, STE).

HABITAT. Often growing in disturbed areas like roadsides or in burnt, cultivated or grazed fields, near rivers, dams and pans, in grassland amongst rocks, on quartzite and dolerite; 1250 – 2450 m.

CONSERVATION STATUS. Least Concern. *Cineraria lyratifomis* is widespread in South Africa and can be found growing as a weed in disturbed areas.

LOCAL NAMES AND USES. Wild parsley (English), boerelusern, geelblom (Afrikaans), khotoliea (Southern Sotho). The Southern Sotho inhale the smoke from burning *Cineraria lyratifomis* for colds and drink a decoction of the root to relieve colic. They also rub the ash from the burnt plant into incisions on the feet to relieve soreness (Watt & Breyer-Brandwijk 1962).

NOTES. This species was renamed *Cineraria lyratifomis* Cron as the name *C. lyrata* DC. was illegitimate due to prior use by Ledebour (1818) for a species from Siberia subsequently identified as *Senecio resedifolius* Less. (Lessing in Chamisso & Schlechtendal 1831: 243). *C. lyratifomis* is characterised by its lyratiform, often dissected leaves and glabrous, broad-winged cypselae. Only two other species of *Cineraria* have such broad-winged cypselae: *C. vallis-pacis* from the Northern Cape and Namibia, and a form of *C. platycarpa* from the Karoo region of the Western and Eastern Cape. In both these species, the cypselae wings are thickly fringed with hairs, whereas in *C. lyratifomis*, they are glabrous or occasionally bear a few short hairs on the shoulders.

Cineraria lyratifomis may be confused with *C. parvifolia* in the more northerly provinces of South Africa due to some similarity in habit and leaf form, but that species has narrowly margined, hairy and ciliate cypselae as opposed to the broad-winged, glabrous (rarely sparsely ciliate) cypselae of *C. lyratifomis*. Trichomes are sparsely present in *C. lyratifomis* and have an agranular tapering base and long apical appendage (Fig. 3C2), and/or glandular hairs may occur in the angles between the lobes of the leaves.

Cineraria lyratifomis is a weedy species and may often be found growing in disturbed soil at the sides of roads or in ploughed fields. It tends to require fairly moist soil, and often grows near dams and pans and along rivers. It was reported to have tainted the flavour of milk and cheese by dairy cows that eat the herb when little else is available, and has been suspected of poisoning pigs in the Free State. It is also problematic in that it may contaminate crop seed collections and may competitively replace grass (Wells *et al.* 1986).

2. *Cineraria abyssinica* Sch. Bip. ex A. Rich. (1847: 433); Oliv. & Hiern (1877: 404); Deflers (1889: 153); Schwartz (1939: 289); Cufod. (1967: 1151). Type: Ethiopia: Mount Scholoda, 1982 – 3354 m [6500 – 11000'], 3 Oct. 1837, *Schimper* 335 (holotype P!; isotypes BM!, BR!, K!, S!); Oudgerate Province, *Petit* (paratype K!).

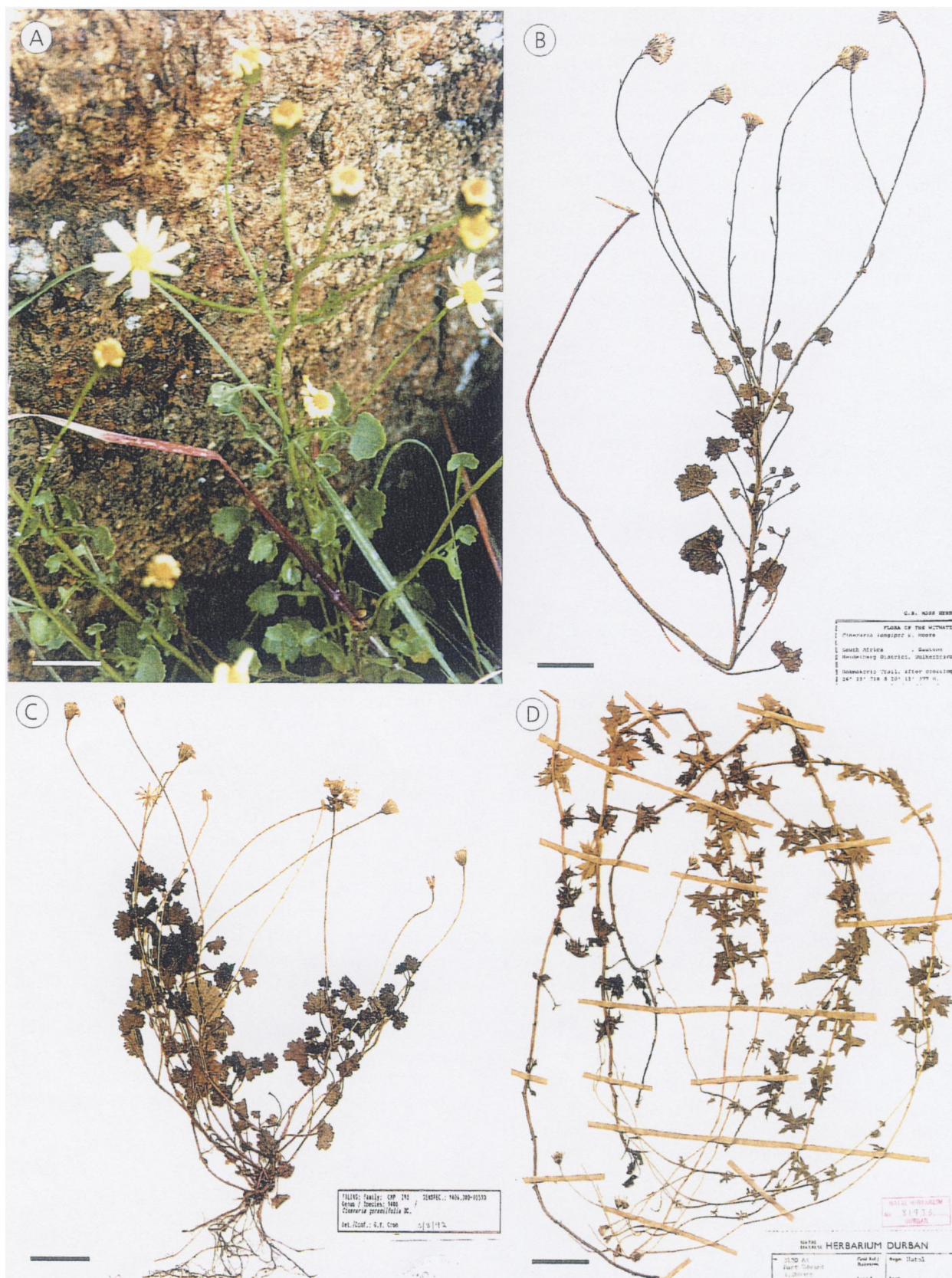


Fig. 8. Herbaceous species of *Cineraria* with few capitula on long peduncles: **A** habit of *C. longipes* at Naturena, Johannesburg, scale bar = 23 cm. **B** *C. longipes* [Cron, Pfab & Mills 485 (J)], scale bar = 27 mm. **C** *C. geraniifolia* [Hilliard & Burt 13228 (K)], scale bar = 28.5 mm. **D** *C. dryogeton* from Umtamvuna Nature Reserve [Abbott 1885 (NH)], scale bar = 40 mm.

Cineraria sebaldii Cufod. (1968: 5); **synon. nov.** Type: Ethiopia, Simèn Mts, Buahit Pass, 4180 m, *Sebald* 1108 (holotype, STU).

Perennial herb or suffrutex, to 0.7 m tall (or longer if straggling). *Stems* woody, branching towards the base, cobwebby, glabrescent or glabrous, lined, a greenish-straw colour to purple, c. 3.5 mm in diameter near the base. *Leaves* lyrate-pinnatifid, with the terminal lobe the largest, 1, 2 or 3 pairs of lateral leaflets along petiole, uppermost leaves sometimes sessile and amplexicaul, lowermost leaves sometimes roundish-reniform to orbicular, distinctly lobed; lamina 15–63 mm × 10–63 mm (in total), cobwebby, glabrescent and dark green above, white tomentose below, especially on younger leaves, to cobwebby and glabrescent, lower leaves sometimes almost glabrous, buds very woolly; apex acute to obtuse; margin coarsely dentate; base cuneate to truncate to subcordate (to cordate on lower leaves); petiole 14–50 mm long, cobwebby; auricles present, auriform, dentate. *Capitula* heterogamous, radiate, many (e.g. 12–34 per stem) arranged in a lax corymbose panicle; peduncles 2–25 mm long, cobwebby, bracteate. *Involucre* with few calyculus bracts; phyllaries (11–)12 or 13, 4–5 mm long, glabrous, though slightly woolly when young; margins scarious. *Ray florets* 5–8, 3.2–4.2 mm long; limb 1.3–2.2(–3.5) mm long, 4-veined. *Disc florets* c. 26–30(–45); corolla 3–4 mm long. *Cypselae* obovate, compressed, with prominent rib on the outer concave surface, inner rib less conspicuous, margined, black, (1.8–)2.0–2.5 mm long, glabrous, or rarely with a few hairs near top on outer surface. *Pappus* as long as disc corolla or slightly longer. Fig. 5B.

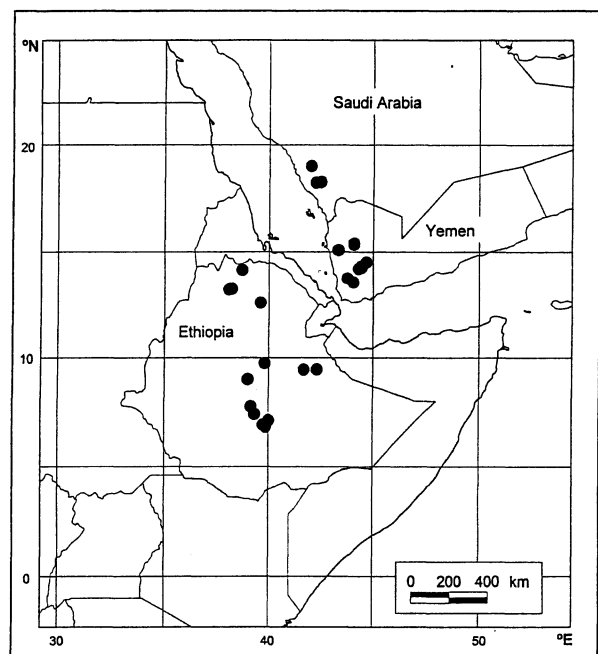
PHENOLOGY. Flowering from September to January, also in April and May (rarely in February).

DISTRIBUTION. The mountains of Ethiopia (Gonder, Tigray, and Arsi Provinces), notably in the Simèn and Bale Mts, and from a single collection in Eritrea; also in the highlands of Yemen and Saudi Arabia (Map 2). Also noted as occurring in Somalia (Glover 1947).

SELECTED COLLECTIONS. ETHIOPIA: Gonder (Begemdir) Province, Simèn Mts, Buahit, 18 Oct. 1973, *Hedberg & Aweke* 5453 (K, UPS); Simèn Mts, valley between Geech and Ambaras, 19 Sept. 1969, *De Wilde & Gilbert* 82 (EA, UPS, WAG); Simèn Mts National Park, between Chenek and Ambaras, 17 Sept. 1974, *Verfaillie* 381 (BR, WAG); Simèn Mts, Buahit-Pass, *Sebald* 1108 (holotype of *C. sebaldii*, STU); Bale Mts National Park, 30 Oct. 1973, *Hedberg* 5549 (K, UPS); Mt Boachit, 28 Oct. 1850, *Schimper* 194 (P); Arsi (Arussi) Province, Chilalo Awraja, near Sagure, c. 30 km S of Asela, 23 Oct. 1971, *Thulin* 1550 (EA, K, UPS); Bale Province, c. 80 miles E of Shashemene, 28 May 1972, *Ash* 1666 (K); Bale Region, Sanetti Plateau

and Mount Batu, 8 Nov. 1982, *Anderberg* 1699 (S, UPS); Sanetti Plain, 15 miles SW of Goba, 4300 m, 19 April 1958, *Mooney* 7240 (K); 20 miles S of Goba, Sanetti Plateau, Bale Province, 3900 m, 22 June 1976, *Ash* 3534 (K); Bale Region: 31 km from Goba on the road to Dolo Mena, 24 Oct. 1984, *Friis, Gilbert & Vollesen* 3403 (K, UPS); Wofasha, near Debra Sinai, Shoa, 27 April 1959, *Mooney* 7839 (K); Tigray, near Ashangi Lake, 27 May 1960, *Mooney* 8594 (BR, K, S); Démérqui, 12 Oct. 1852, *Schimper* 930a (P); Shewa, Mt Fure, SW of Addis Ababa, 23 June 1974, *Gilbert* 3488 (K); Mt Scholoda, 3 Oct. 1837, *Schimper* 335 (holotype P, isotypes BM, BR, K, S); Oudgerate Province, *Petit* s.n. (paratype K). YEMEN: Summit of Jabal an Nabi Schu'ayb, 20 Sept. 1978, *Miller* 166 (K); Mts above Summarra Pass, 22 Oct. 1982, *Bisset* 204 (K); Close to Yarim, 3 Jan. 1938, *Scott & Britton* 406 (BM, EA); 10 km SW of Yarim, *Hepper* 5641 (K); Moutang Plains, Jan. 1976, *Acres* 315 (K); Jebel Sabir, Taiz, 27 Dec. 1974, *Wood* Y/74/374 (BM); 50 km from San'a towards Hodeida, 21 Sept. 1962, *Popov* PB12 (BM); E of Suq al Khamis, 29 Sept. 1976, *Lavranos & Newton* 13058 (PRE). SAUDI ARABIA: Asir, Raida Escarpment, 9 May 1992, *I. & O. Hedberg* 92113 (K, UPS); Al Mahmoud, 35 km N of Abha, 10 km below Jabal Sawdà, 21 May 1980, *Boulos & Ads* 14148 (K); 13 km NW of Abha, Jabal Sawdà road, 23 Sept. 1983, *Collenette* 4577 (K). ERITREA: Eritrea-Amasen Region, *Pappi* 1611 (BM) (very glabrescent specimen).

HABITAT. Shady places, amongst rocks and/or bushes on mountain slopes, at the edge of the escarpment, on banks near roadsides and at the edge of cultivation, in damp soil near water bodies, often in



Map 2. Known distribution of *Cineraria abyssinica*.

association with *Helichrysum*, *Erica* or *Juniperus* in the alpine belt, limestone, loamy ground; 2500–4100 m (Ethiopia), 2300–3150 m (Yemen).

CONSERVATION STATUS. Data Deficient. Fairly widespread. In Ethiopia, people live in the national parks, where overgrazing and burning of moorlands to improve grazing, clearance for agriculture, fuelwood collection and soil erosion are the major threats (Boulos *et al.* 1994). The Asir National Park was established in Saudi Arabia in 1981 (Boulos *et al.* 1994), but there are no protected areas in Yemen. Severe overgrazing, cutting of wood for fuel and timber and lack of maintenance of field terraces leading to increased soil erosion are all factors affecting the biodiversity in the region (Boulos *et al.* 1994).

LOCAL NAMES. Muri (Oromo: near Addis-Ababa).

NOTES. The characteristically short ray florets and the very dissected, lyrate-pinnatifid uppermost leaves help to distinguish *Cineraria abyssinica* from *C. deltoidea* (previously *C. grandiflora*) in Ethiopia. In addition, its cypselae are black with a prominent median rib when mature and its involucre bracts are narrower than in most other species of *Cineraria*. Fine cobwebby trichomes (with a narrow 2–4-celled base; Fig. 3D) create a white woolly tomentum on leaves and stem (especially when young) as opposed to the trichomes with a tapering multi-celled base commonly seen in *C. deltoidea* (Fig. 3C; although it should be noted that the fine trichomes do occur in some specimens of *C. deltoidea*, predominantly in southern Tanzania).

Specimens previously identified as *Cineraria sebalzii* are simply a high altitude form of *C. abyssinica*, comprising smaller plants (c. 10 cm tall), with slightly larger and fewer capitula. This is a common pattern in *Cineraria*, seen, for example, in *C. deltoidea* and *C. erodioides*. The leaves of these high altitude forms of *C. abyssinica* [e.g. Mooney 7240 (K) from Bale Province, 4300 m] tend to be reniform with lateral pinnae and only a few of the uppermost leaves are lyrate-pinnatifid. However this is also seen in other specimens of *C. abyssinica*. The involucre bracts are more cobwebby than usual for *C. abyssinica*, but this may be a function of the age of the plant as well as altitude. An intermediate form is seen in Ash 3534 (K; Bale Province, 3900 m): a tufted growth form, but with lyrate-pinnatifid leaves and many capitula.

3. *Cineraria atriplicifolia* DC. (1838: 308); Harv. (1865: 312); Hilliard (1977: 376). Type: South Africa, Durban [Port Natal], Drège 5137 (holotype G-DC!, isotypes E!, K!, MO!, PRE!).

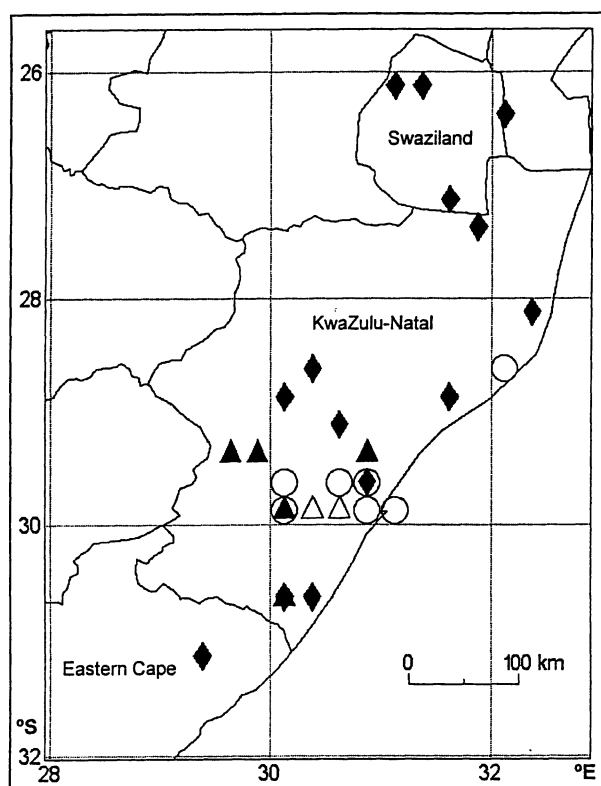
Short-lived perennial herb, erect, to c. 0.75 m. Stems herbaceous, woody towards the base, slender, branching, glabrous. Leaves deltoid to hastate in

outline, deeply lobed with apical lobe usually more than half total length of lamina, upper leaves often pinnatifid or very dissected; lamina 13–58 × 9–50 mm, lower leaves deeply to occasionally shallowly lobed; lamina 8–48 × 7–40 mm, glabrous, but with few hairs on margin in angles of lobes; apex acuminate; margin dentate; base truncate to subcordate; petiole (5–)11–47(–58) mm long, glabrous; auricles present, lanceolate, dentate. Capitula heterogamous, radiate, many, arranged in lax corymbose panicles; peduncles 7–31(–43) mm long, glabrous, bracteate (bracts below capitula 1.6–3.0 mm long). Involucre calyculate; phyllaries 8(–12), (3.5–)4–5(–6) mm long, glabrous; margins scarious. Ray florets 5 or 6, 5.0–7.5 mm long; limb 3–5 mm long, 4-veined (rarely 5- or 8-veined). Disc florets 12–16(–21); corolla 3.5–5.0 mm long. Cypselae obovate, compressed, margined, brown, 2.0–3.0 mm long, glabrous. Pappus c. 3.5 mm long. Fig. 5C.

PHENOLOGY. Flowering between March and July, with occasional collections in September and October.

DISTRIBUTION. South Africa, only in KwaZulu-Natal, predominantly in the areas around Pietermaritzburg and Durban. (Map 3).

SELECTED COLLECTIONS. SOUTH AFRICA: KwaZulu-Natal: Empangeni, Mposa, Oct. 1951, Munro P. S. 387



Map 3. Known distribution of *Cineraria atriplicifolia* (O), *C. decipiens* (◆), *C. glandulosa* (▲) and putative hybrids between *C. atriplicifolia* and *C. glandulosa* (△).

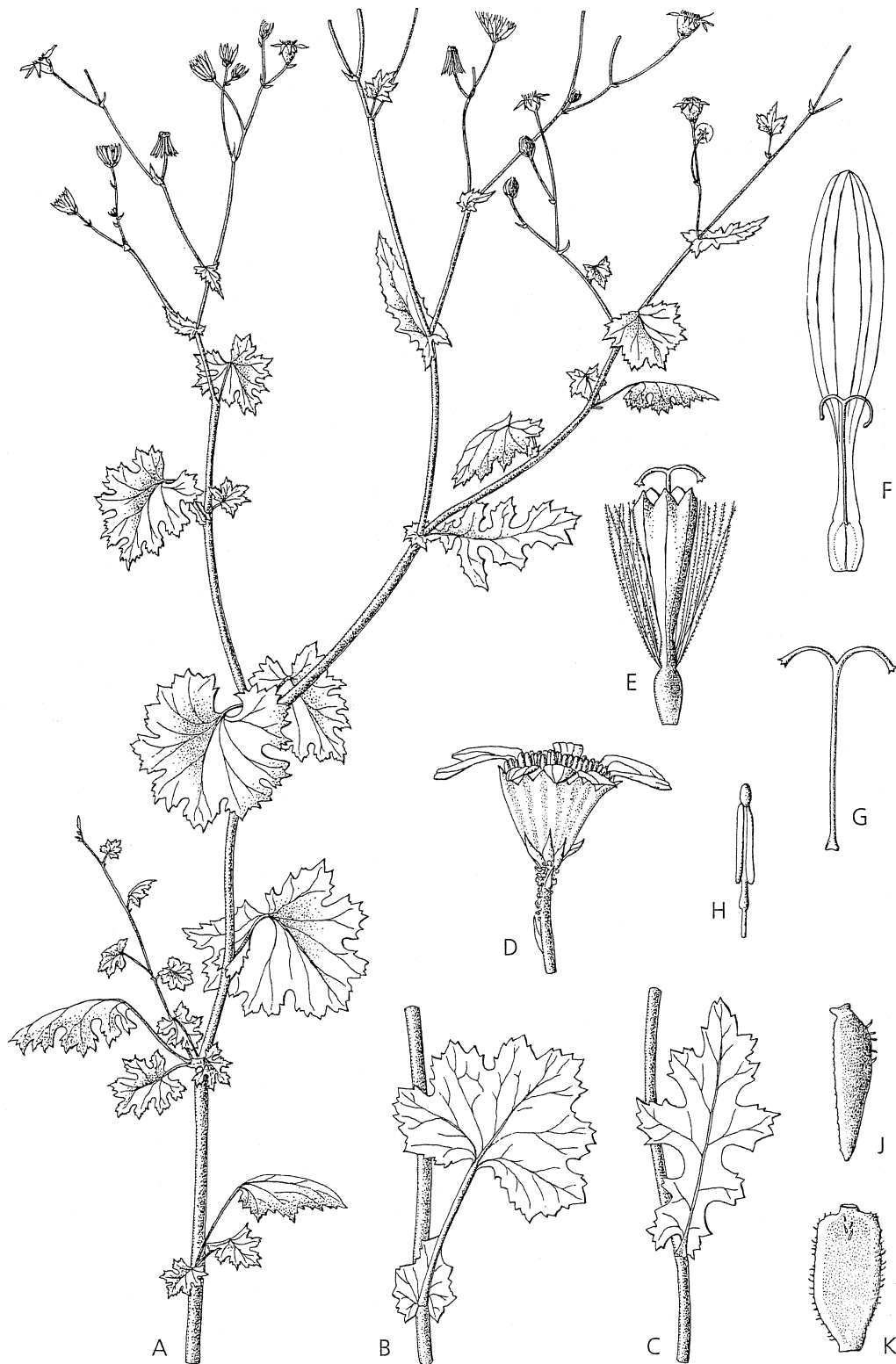


Fig. 9. *Cineraria erodioides*. **A** habit; **B** lower to middle leaf; **C** upper leaf (**A** – **C** $\times 0.85$); **D** capitulum ($\times 2.5$); **E** disc floret; **F** ray floret (**E**, **F** $\times 5$); **G** style of disc floret; **H** stamen; **J** cypselid, side view; **K** cypselid, front view (**G** – **K** $\times 8.5$). [**A**, **D**, **J**, **K**: Cron & Goodman 538 (J)]; [**B**, **C**: Hilliard & Burt 6727 (NU)]; [**E** – **H**: Hilliard & Burt 12322 (NU)]. DRAWN BY SANDIE BURROWS.

(PRE); Zululand, *Gerrard* 1692 (BM, BOL); Richmond Distr., Seven Fountains, *Wylie sub Wood* 8182 (NBG); Ixopo Distr., Umkomaas R. valley, above Hella-Hella, 29 April 1977, *Hilliard & Burt* 10319 (K, MO, NU, PRE); Camperdown Distr., Umgeni R. Valley, Nagle Dam, 14 May 1957, *Wells* 1322 (PRE); Montesseel, Inchanga, 29 May 1989, *Cron* 7 (J, K, MO, NU); Inanda, April 1880, *Medley-Wood* 515 (BOL, K, NH); Pinetown, Everton, 15 April 1963, *Hilliard* 1506 (NH); Durban flats, Durban, March 1887, *Medley Wood* 1026 (BM, K, P, UPS, Z); Durban, *Drège* 5137 (holotype G-DC, isotypes E, K, MO, PRE).

HABITAT. North- or east-facing slopes, frequently in dry thornveld or scrub, also at the edge of bush or forest and below cliffs, on Natal Group Sandstones; 30 – 800 m (to 1200 m at Seven Fountains).

CONSERVATION STATUS. This species is considered to be Near Threatened due to its restricted distribution and population size. Its habitat is however inhospitable to humans and therefore relatively undisturbed. Scott-Shaw (1999) rated *Cineraria atriplicifolia* as being of 'Least Concern', but possibly included specimens of *C. decipiens* in his assessment (based on his outline of the distribution of the species).

NOTES. *Cineraria atriplicifolia* is distinguished from *C. decipiens* by its glabrous cypselae, and from *C. deltoidea* by the deeper lobing of its leaves, which are also more pinnatifid, and by its lanceolate (not auriform) auricles. Its growth form also differs from *C. deltoidea* in that it does not form scrambling shrubs or creepers. The entire plant is essentially glabrous, except for a few trichomes in the angles of the lobes of the leaves. These trichomes are of two types: (i) glandular and capitate, c. 6 cells forming uniseriate stalk (Fig. 3A); and (ii) short, eglandular, slightly tapering, 8 – 9 cells (Fig. 3B).

Putative hybrids between *Cineraria atriplicifolia* and *C. glandulosa* have been identified, as discussed and listed under *C. glandulosa*.

4. *Cineraria deltoidea* *Sond.* (1850: 68); *Harv.* (1865: 312); *Hilliard* (1977: 379); *Maquet* (1985: 670); *Jeffrey* (1986: 930); *Lisowski* (1991: 434). Type: South Africa, Natal, *Gueinzius* 343 [holotype S (photographs!); isotypes MEL (photographs!), P!, W].

Cineraria grandiflora *Vatke* (1875: 503); *Hedberg* (1957: 222 & 349). Type: Ethiopia, Dshan Mèda, 2620 m [8600'], Sept. 1863, *Schimper* 1517 (holotype B†; isotypes BM!, K!, S!).

C. abyssinica forma *longiradiata sensu* *Oliv.* (1887: 340) non *C. abyssinica* *Sch. Bip. ex A. Rich.* Type: as above.

C. kilimandscharica *Engl.* (1891 publ. 1892: 439). Types: Tanzania, Mt Kilimanjaro, 1300 – 2300 m, 1884, *Johnson* 4, 120, 129 (syntypes K!).

C. bracteosa *O. Hoffm. ex Engl. in Götzen* (1895: 383). Types: Democratic Republic of Congo (DRC),

Ninagongo, 2500 and 3000 m, *Götzen* 64 & 106 (syntypes B†).

C. prittwitzii *O. Hoffm. ex Engl. in Götzen* (1895: 383). Type: DRC, plains at Ninagongo, 2000 m, *Götzen* 29 (holotype B†).

C. buchananii *S. Moore* (1902a: 352). Type: Malawi, 1895, *Buchanan* 10 (holotype BM!; isotypes GRA!, PRE!, SAM!).

C. gracilis *O. Hoffm.* (1906: 206); **synon. nov.** Type: Ethiopia, Sidamo Province, 'Gallahochland', Djam-Djam Mt range, *Ellenbeck* s.n. (holotype B†).

Senecio kirsteineanus *Mushl. in Mildbr.* (1911: 405). Type: Rwanda, SE of Karasimbi, W of Lake Karago, *Mildbraed* 1647 [holotype B†; isotype BR! (fragment)].

Senecio schubotzianus *Muschl. in Mildbr.* (1911: 405). Type: DRC, Ninagongo, 3200 m, *Mildbraed* 1416 [holotype B†; isotype BR! (fragment)].

C. densiflora *R. E. Fr.* (1928: 147). Type: Kenya, Mt Kenya, N slope, Feb. 1922, *Fries & Fries* 1555 (holotype UPS!; isotype S!).

C. laxiflora *R. E. Fr.* (1928: 146). Type: Kenya, Aberdares, Sattima, 3000 m, *Fries & Fries* 2651 (holotype UPS!; isotype S!).

C. monticola *Hutch.* (1931: 251). Type: South Africa, Limpopo Province, Soutpansberg, ascent to Wylie's Poort, 29 June 1930, *Hutchinson & Gillett* 3201 (holotype K!).

C. bequaertii *De Wild.* (1932: 441). Type: DRC, lava plains between Tongo and Mukule, 25 Sept. 1914, *Bequaert* 5863 (holotype BR!).

Perennial herb, erect or scandent, often climbing, to 1.5 m (scrambler), often 0.6 m tall/long. *Stems* slender, herbaceous, woody and branching towards the base, glabrous or sparsely hairy or very hairy or cobwebby, glabrescent. *Leaves* deltoid to deltoid-reniform, distinctly to shallowly lobed, upper leaves often with lateral pinnae below the main lamina, occasionally lyrate; lamina 10 – 60(– 80) × 11 – 65(– 73) mm, bright green, glabrous or hairy or cobwebby, glabrescent above, usually hairy below especially on veins, or thickly cobwebby; apex acute to obtuse; margin coarsely dentate; base truncate, subcordate or cordate; petiole (5 –)11 – 41 (– 68) mm long, sparsely or densely hairy or cobwebby; auricles small or large, auriform, coarsely dentate. *Capitula* few to many in lax corymb or more compact corymbose panicle; peduncles (2 –)6 – 44 mm long, glabrous or hairy and glabrescent, or cobwebby, bracteolate. *Involucre* calyculate; phyllaries 8 – 13 (– 14), 3.5 – 8.0(– 13.0) mm long, glabrous, occasionally cobwebby amongst calyculus bracts; margins scarious, apices sometimes purple. *Ray florets* 5 – 8(– 13), rarely as many as 16, 4.8 – 12.0 (– 16.0) mm long; limb (3.5 –)4.0 – 10.5(– 14.0) mm long, 4-veined (– 6-veined). *Disc florets* 14 – 32 (– 39); corolla 3.5 – 5.5 mm long.

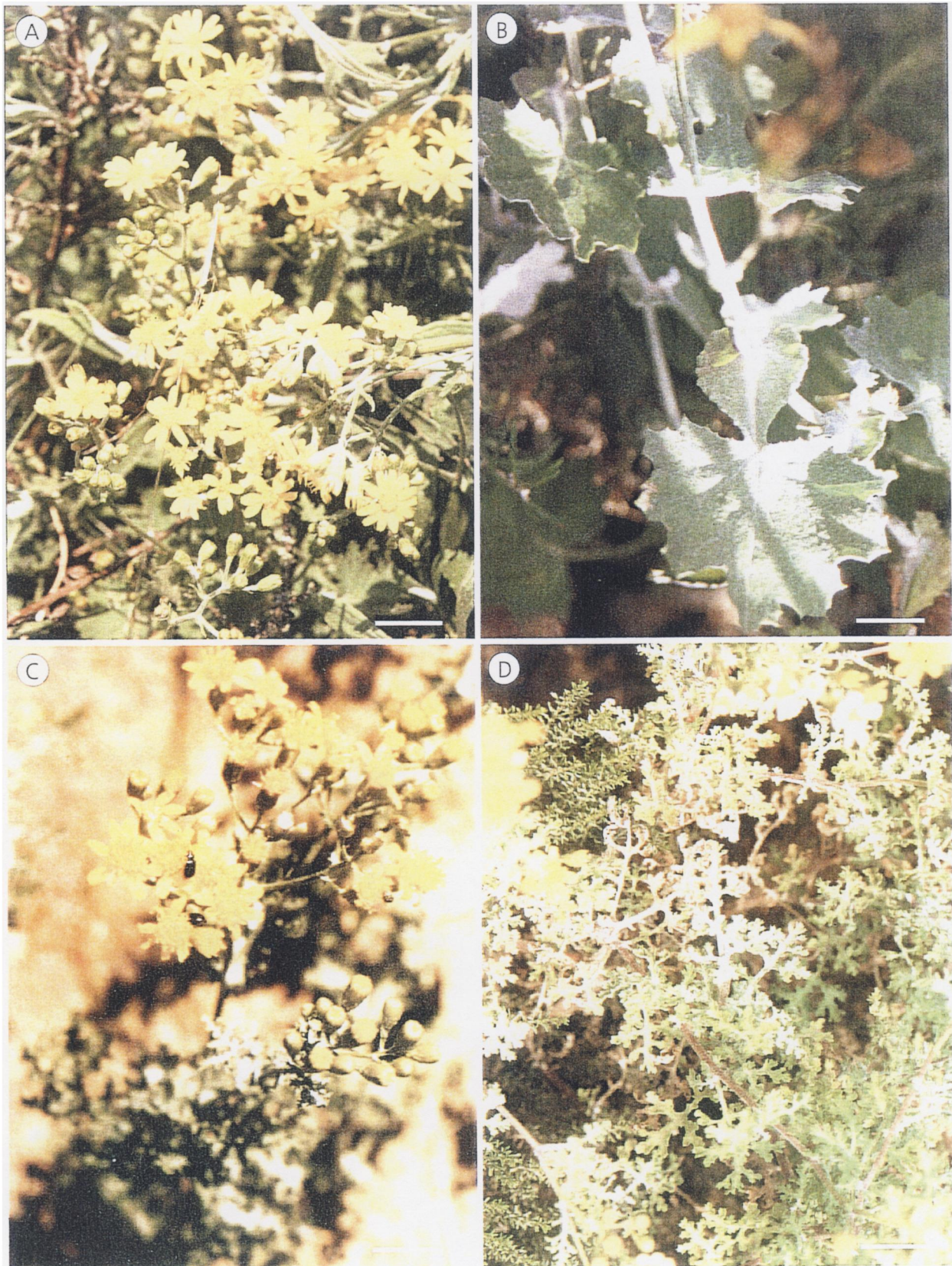


Fig. 10. *Cineraria erodioides* and *C. aspera*: **A** *C. erodioides* growing at Joubert's Pass, Witteberg, scale bar = 15 mm; **B** leaf of *C. erodioides* var. *tomentosa* showing large auricles, scale bar = 11 mm; **C** capitula of *C. aspera* forming a lax corymb, scale bar = 11 mm; **D** pinnatifid leaves of *C. aspera*, scale bar = 27.5 mm.

Cypselae obovate, compressed, margined (to narrow-winged), dark brown (to black), often with paler margin or wing, (1.8–)2.0–3.0(–3.5) mm long, glabrous or ciliate on margins and/or faces to varying degrees. *Pappus* c. 5 mm long. Fig. 5D.

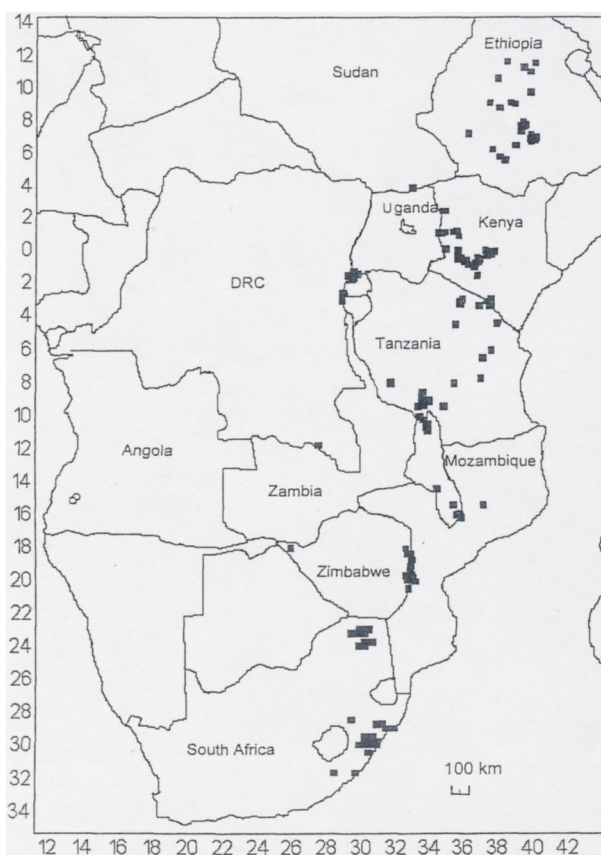
PHENOLOGY. Flowering all months of the year, but predominantly in July to August in East Africa and in April to July in South Africa.

ILLUSTRATION. Hilliard (1977: 378).

DISTRIBUTION. Ethiopia, Sudan, Uganda, Kenya, Rwanda, Democratic Republic of Congo, Tanzania, Malawi, Zambia, Zimbabwe, South Africa, KwaZulu-Natal and the Eastern Cape (Map 4).

SELECTED COLLECTIONS. ETHIOPIA: Bale Province, Bale Mountains National Park, 31 Oct. 1973, *Hedberg* 5581 (K, UPS); 31 km S of Goba, on road Dolo Mena, 24 Oct. 1984, *Friis, Gilbert & Vollesen* 3415 (K, UPS); Sanetti Plateau, Bale Province, c. 20 km S of Goba, 6 April 1975, *Ash* 2860 (BR, K, UPS, US, WAG); Bale Region, 10 to 15 km SE of Goba on the road to Masslo, 16 May 1980, *Thulin, Hunde & Tadesse* 3688 (K, UPS); Kaffa Province, Bonga Area, Geetsha R. near Wush-Wush, 26 Jan. 1970, *de Wilde* 6278 (K, PRE, WAG); Mt Cacca, 25 Dec. 1953, *Mooney* 5272 (K); Mt Boruluccu, 50 km SE of Asela, 16 Nov. 1966, *de Wilde*

10057 (K, PRE, WAG); Arussi Province, Chilalo Awraja, Galama Mts, 30 km ESE of Boraluco, 6 Sept. 1967, *Hedberg* 4164 (K, UPS); about 5 km N of Addis Ababa, lower slopes of Mt Entotto, 31 Dec. 1965, *de Wilde* 9496 (BR, WAG); Shewa Administrative Region, 26 km N of Gedo on the road to Fincha, 27 Oct. 1982, *Ånderberg* 1630 (S, UPS); Mussolini Pass, between Debra Sina and Debra Birhan, 8 Jan. 1966, *de Wilde* 9661 (BR, PRE, WAG); Choké Mts, Upper Godeb Valley, 3 Aug. 1957, *Henley & Leakey* 612 (K); Coronation Hill, 40 km W of Ambo, *Albers* 61143 (K). SUDAN: Sudan, Southern (Equatoria) Province, Torit Distr., slopes of Mt Kinyeti, 28 March 1949, *Jackson* 648 (BM); Torit Distr., Lotuke, 15 Nov. 1949, *Jackson* 977 (BM); Imatong Mts, 10 Feb. 1936, *Johnston* 1475 (BR, K); Kippia, Imatong Mts, 29 Dec. 1935, *Thomas* Th1812 (BM). UGANDA: Mt Elgon, 29 Oct. 1916, *Snowden* 475 (BM, K); Bugishu Distr., Mt Elgon, western slope above Budadiri, 5 Dec. 1967, *Hedberg* 4484 (K, UPS); Kigezi Distr., Mt Muhavura, western slopes, 3 Oct. 1948, *Hedberg* 2057 (K, UPS); Saddle between Muhavura and Mgahinga, 24 Oct. 1954, *Stauffer* 614 (BR, K, PRE, Z); Northern Province, Karamoja Distr., Matheniko County, Moroto Mt, Dec. 1954, *Philip* 755 (K). DEMOCRATIC REPUBLIC OF CONGO (DRC): Route Rutshuru-Goma, near Matyaso, 17 Dec. 1944, *Germain* 3049 (BR); Virunga National Park, Tshamagussa, 2 Aug. 1954, *de Witte* 1851 (BR, K); Virunga National Park, near Rumangabo, 1958, *Donis* 4080 (BR, WAG); Matyaso, between Rumangabo and Lulenga, 20 Nov. 1944, *Germain* 2831 (BR); Lulenga, 4 March 1927, *Linder* 2210 (K); Rugari, 45 km on route Goma-Rutshuru-Kivu, 6 Aug. 1948, *Mullenders* 2522 (BR); Nyamulagira, N side, Shabubembe, 27 Aug. 1952, *Stauffer* 206 (BR, UPS, WAG); Kikomero, Nov. 1937, *Lebrun* 8443 (BR, K); Volcan Mikenko, April 1929, *Humbert* 8090 (BR); Virunga National Park, Bisoke Volcano, R. Susa, 2 Feb. 1955, *de Witte* 2222 (BR, K); Mt Karasimbi, N slope, 19 March 1927, *Linder* 2388 (K); Kivu Province, Kibati-Kibumbu, 1929, *Scaetta* 1548 (BR, K); Mount Muhi, 2 Aug. 1955, *Kinet* 10 (BR). RWANDA: Rwanda, Muhavura Crater, Virunga National Park, 1940–1941, *Ganshof* s.n. (BR); Rwanda, Parc des Volcans, Karasimbi-Visoke saddle, 5 Feb. 1975, *D'Arcy* 7580 (K); Ruhengeri-Gisenye, 4 Feb. 1972, *Bamps* 3087 (BR, K, WAG); Mutara, Gishwati forest, 14 Aug. 1984, *Lejoly* 84/302 (BR). KENYA: Timboroa, July 1969, *Tweedie* 3667 (PRE); Mau Range, c. 10 km N of Timboroa, 2 June 1948, *Hedberg* 1097 (S, UPS); Nyanza Province, Trans Nzoia Distr., Mt Elgon, 21 Feb. 1935, *Taylor* 3519 (S); Mt Elgon, eastern slope above Japata Estate, 23 Feb. 1948, *Hedberg* 118 (S, UPS); Northern Cherangani Hills, SE Kabichbich, *Thulin & Tidigs* 103 (UPS); Karamoja Distr., Moroto Mt, April 1958, *Wilson* 433 (K); Mt Kenya, Sirimon Track, 17 Sept. 1970, *Kokwaro* 2396 (BR, K); Mt Kenya, western alpine region, on ridge S of Teleki Valley, 12 Aug. 1948, *Hedberg* 1890



Map 4. Known distribution of *Cineraria deltoidea* (■) and *C. huilensis* (○).

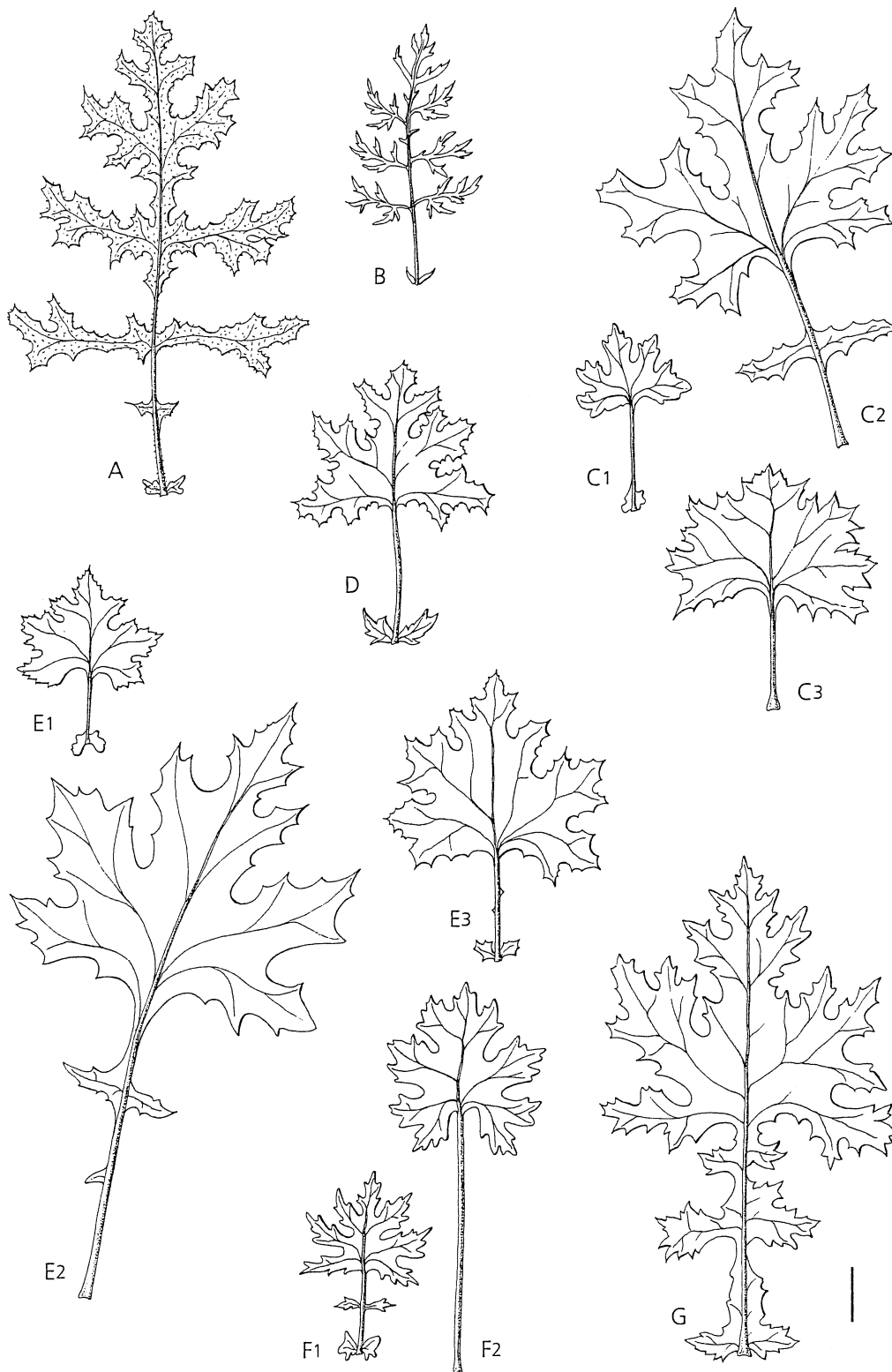


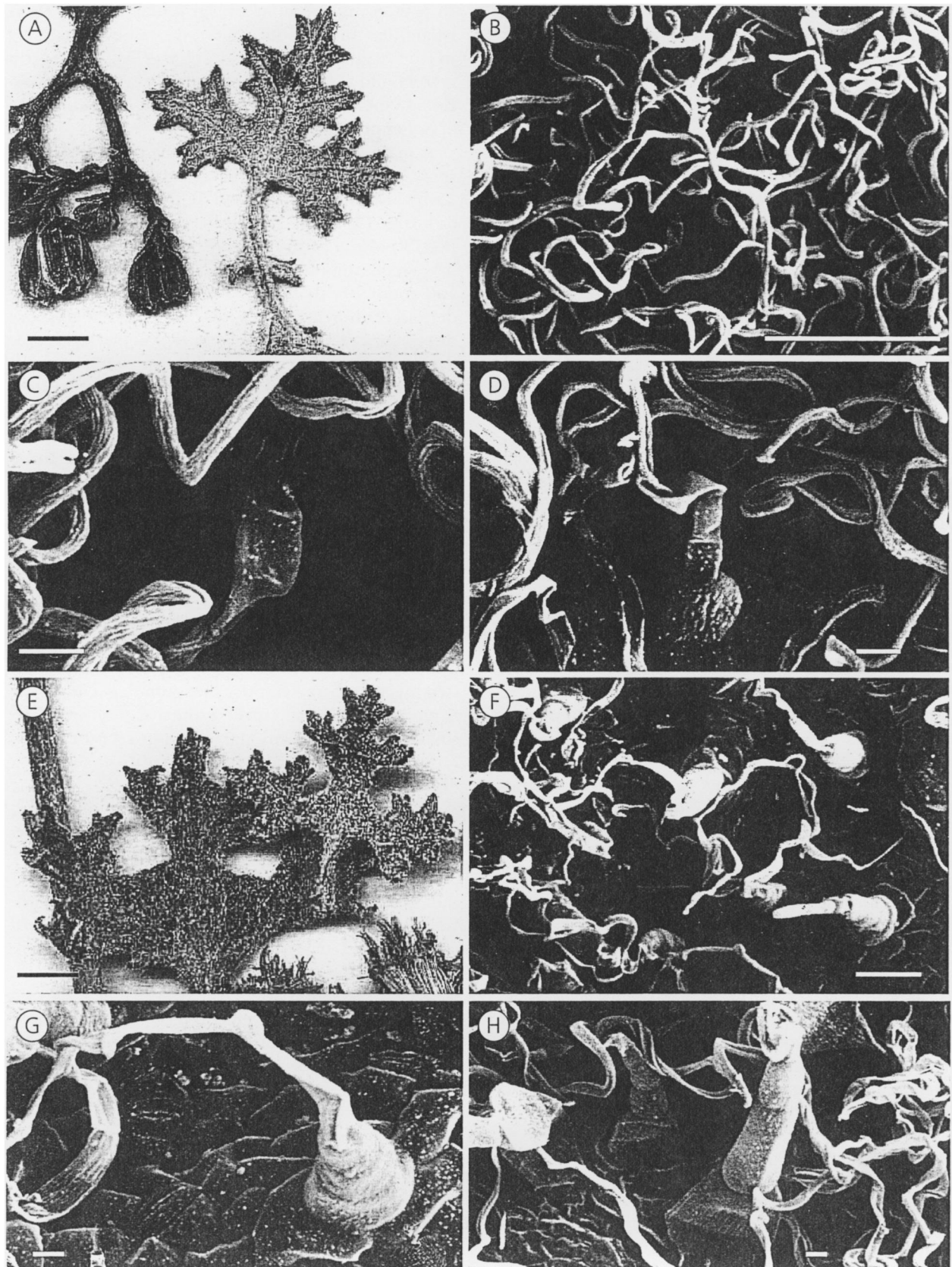
Fig. 11. Leaves of *Cineraria*: **A** *C. aspera* [Cron & Goodman 550 (J)]. **B** *C. cyanomontana* [Cron, Knox & Winter 350 (J)]. **C:** **C1,2** *C. canescens* var. *canescens* [Schlechter 8274 (K)]; **C3** *C. canescens* var. *flabellifolia* [Salter 797 (K)]. **D** *C. erosa* [Cron & Perrett 330 (J)]. **E** *C. mazoensis* var. *mazoensis* [**E1** Cron & Balkwill 486 (J), **E2** Fanshaw 6591 (K)], **E3** *C. mazoensis* var. *graniticola* [Cron & Balkwill 532 (J)]. **F** *C. foliosa*: **F1** upper leaf, **F2** lower leaf [Goetze 973 (BR), isotype]. **G** *C. pulchra* [Cron & Balkwill 504 (J)]. Scale bar = 1 cm. DRAWN BY SANDIE BURROWS.

(EA, S, UPS); Mt Kenya, Metior Station, 11 Jan. 1975, *Croat* 28202 (MO); Aberdare range, near western part of Nyeri track, 11 July 1948, *Hedberg* 1496 (EA, K, S, UPS); Meru Distr., tracks to Lake Ellis, 16 – 18 Aug. 1985, *Robertson* 3921 (EA); Aberdares, path to Satima, 5 July 1996, *Muasya, Cron & Knox* 8 (EA, J); Kinangop, 21 March 1963, *Polhill* 2 (K); Ngong Hills, central peaks, 15 April 1956, *Beentje* 1843 (EA, WAG); Nakuru Distr., Eastern Mau Forest Reserve, 27 Aug. 1949, *Maas Geesteranus* 5931 (BR, K, PRE, WAG); Ravine Distr., Lake Naivasha, 16 Oct. 1953, *Drummond & Hemsley* 4807 (BR, K); Narok Distr., Nasampolai Valley, 12 Aug. 1972, *Greenway & Kanuri* 15041 (K, PRE); Mt Longonot, crater rim, 26 July 1981, *Gilbert & Hedberg* 6297 (K, UPS); Nyanza Province, Londiani Distr., Tinderet Forest Reserve, Camp 6, 14 July 1949, *Maas Geesteranus* 5503 (BR, K, PRE, WAG); Kenya, Marakwet Hills, June 1935, *Dale* 3422 (BR, K). **TANZANIA:** Mt Kilimanjaro, about 2 km E of Peter's hut, 20 June 1948, *Hedberg* 1293 (K, S, UPS); Ngorogoro Crater, S rim, between Crater Lodge and Wildlife Lodge, 2300 m, 15 Sept. 1977, *Raynal* 19048 (BR, WAG); Mt Meru, western slopes above Olkakola Estate, 27 Oct. 1948, *Hedberg* 2317 (K, S, UPS); Shishiye Area, NE slope of Hanang, *Carmichael* 1512 (K); Kilosa Distr., Ukaguru Mts, Mamiwa Forest Reserve, summit beacon on Mamiwa, 16 Aug. 1972, *Mabberley & Salehe* 1502 (K); Iringa Distr., northern part of Gologolo Mts, 13 Sept. 1970, *Thulin & Mbhoru* 935 (UPS); Ufipa Distr., Mbisi, 6 Oct. 1950, *Bullock* 3403 (BR, K); Mbeya Distr., Poroto Mts, Livingstone Forest Reserve, 28 Sept. 1970, *Thulin & Mbhoru* 1241 (K, UPS); Ruvuma region, Kitulo, 30 Sept. 1968, *Prins-Lampert* 196 (WAG); Njombe Distr., about 19 km S of Njombe, 10 July 1956, *Milne-Redhead & Taylor* 11110 (BR, K); Nyasa Hochland: Station Kyimbila, *Stoltz* 274 (S, WAG). **MALAWI:** Near Chisenga, Northern Malawi, 27 Aug. 1962, *Tyrer* 594 (BM, K); Malawi, Dembo Bridge, 17 July 1987, *la Croix* 4601 (PRE); Nyika Plateau, North Nyasa Distr., 17 Aug. 1946, *Brass* 17299 (K, MO, US); Nyika Plateau, Chowo Rocks, 17 May 1970, *Brummitt* 10859 (K, UPS); Chiradzulo Peak, Zomba Plateau, 7 Aug. 1984, *Balaka & Nachomba* 508 (PRE); Zomba Plateau on road to Chingwe's Hole, 18 July 1979, *Salubeni & Tawakali* 2599 (BR, WAG); Blantyre Distr., Ndirande Mt, 28 June 1970, *Brummitt* 11715 (K); Mt Mulanje, Lake Ruo Plateau, 16 Aug. 1956, *Newman & Whitmore* 447 (BM, BR, WAG). **ZAMBIA:** Nyika, 29 Dec. 1962,

Fanshawe 7927 (K). **ZIMBABWE:** Nyanga, Mtenderere Source, 4 Sept. 1954, *Wild* 4591 (K, MO); 71 km from Rusape on Rusape-Juliasdale-Nyanga road, 17 May 1998, *Cron & Balkwill* 497 (B, CM, E, J, K, MO, PRE, RSA, S); Chimanimani, *Swynnerton* 1875 (BM, K, Z); Mt Silinda, Eastern Highlands, 1 March 1984, *Bayliss* 10168 (PRE); near Cashel on Cashel – Chimanimani Road, 20 May 1998, *Cron & Balkwill* 515 (J, K, MO). **MOZAMBIQUE:** Zambesia, Guruè, Pico, Namuli, 23 Sept. 1944, *Mendonça* 2247 (LISC); Zambesia, Milange, 13 Oct. 1942, *Torre* 4606 (LISC); Manica e Sofala, Tsetsera, 10 Feb. 1955, *Exell, Mendonça & Wild* 360 (BM, LISC); Manica e Sofala Distr., southern tip of Chimanimani Mts, 31 May 1969, *Müller* 1248 (LISC, K, PRE). **SOUTH AFRICA:** Limpopo Province: ascent to Wylie's Poort, Farm Cloud End 279 LS, near Makhado (Louis Trichardt), 12 May 1994, *Cron, Balkwill, Balkwill & Otto* 281 (B, BM, E, J, K); Tato Vondo Forestry Reserve, Sibasa Distr., 6 June 1977, *Hemm* 125 (J, PRE, PRU); Duiwelskloof, 29 May 1929, *Galpin* 10117 (K, PRE); Woodbush, 6 Dec. 1997, *Cron & Knox* 343 (J, LISC); KwaZulu-Natal: Van Reenen, *Medley Wood* 10747 (MO); Qudeni Forest, 17 July 1947, *Compton* 19753 (NBG, US); Nkandla Forest, 10 miles SE of Nkandla, 12 June 1946, *Codd* 1380 (K, PRE); 11 miles N of Ixopo on road to Donnybrook, farm 'Lynn Avis', 2 April 1977, *Hilliard & Burt* 10134 (MO, NU, PRE, S); Lion's R. Distr., Karkloof Range, Blinkwater Bush, 7 July 1970, *Hilliard* 5055 (K, NH, NU); Pinetown Distr., Everton, 3 June 1973, *Hilliard* 5373 (K, NU, S); Swartkops Hill, Cedara, 20 July 1952, *Esterhuysen* 20292 (BOL, MO, PRE); Umgeni Falls, 29 Sept. 1893, *Schlechter* 3311 (BOL, GRA, PRE, Z); Pietermaritzburg, 7 July 1918, *Moss* 2596 (BOL, Z); Richmond Distr., Peak of Byrne, 17 April 1977, *Hilliard & Burt* 10168 (MO, NU, S); SE Mid-Illovo, Ismont, *Hilliard* 5070 (K, NH, NU, S); Inanda, Ilafamasi, *Medley Wood* 157 (K, NH); Ndwedwe, 23 June 1967, *Strey* 7507 (NH, PRE, S); Eskotene, Molweni Kloof, 17 Sept. 1987, *A. E. van Wyk* 8138 (NH, PRU); Alexandra Distr., Station Dumisa, Farm Friedenau, 30 June 1908, *Rudatis* 400 (K, WAG); Eastern Cape: Mt Baziya, *Baur* 157 (SAM); Port St Johns, April 1899, *Galpin* 2890 (GRA, K, PRE).

HABITAT. Commonly growing in forest margins where it straggles or climbs supported by the vegetation, amongst riverine bush on banks of streams in valleys, on roadsides and in clearings in forests, amongst rocks in montane grassland, in clearings amongst

Fig. 12 (opposite). Comparison of leaves and trichomes of *Cineraria canescens* var. *canescens* (A – D) and *C. erosa* (E – H). **A** leaf of *C. canescens* var. *canescens* [*Schlechter* 8274 (K)], scale bar = 3 mm. **B** mass of fine trichomes on ventral surface of leaf, scale bar = 100 µm. **C** detail of base of single trichome on ventral surface, scale bar = 10 µm. **D** base of trichome on dorsal surface of leaf [**B – D**: *Leipoldt* 3274 (BOL)], scale bar = 10 µm. **E** leaves of *C. erosa* [*Stokoe* s.n. sub SAM 54753], scale bar = 2 mm. **F** trichomes on dorsal surface of leaf of *C. erosa*, scale bar = 50 µm. **G** trichome with tapering granular base of c. 6 cells joined to multi-celled apical appendage, scale bar = 10 µm. **H** trichomes on ventral surface of leaf of *C. erosa*, scale bar = 10 µm. [**F – H**: *Cron & Perrett* 329 (J)].



bamboo, in open moorland, also in disturbed ground at road sides and a pioneer on fresh lava/volcanic ash in the Virunga Mts, on soils derived from basalt in East Africa, mainly from dolerite in KwaZulu-Natal and quartzite in the Soutpansberg, Limpopo Province; 1600 – 4300 m in East Africa; 500 – 1500 m in South Africa.

CONSERVATION STATUS. Least Concern. This species is very widespread throughout Africa, nevertheless many of its montane habitats are threatened. Logging and civil war have impacted on the montane forests of the DRC and Rwanda, and agriculture and other human activities threaten vegetation in Ethiopia, Tanzania and Malawi.

LOCAL NAMES. Akaniamanganga, Kaniamaganga, Kasogo, Ruvunanga (dialect Kinyaruanda).

NOTES. *Cineraria deltoidea* is the most widespread and variable of all the species in *Cineraria*, ranging from near sea level in KwaZulu-Natal, South Africa to over 3000 m in the mountains of East Africa and Ethiopia. It varies in terms of growth form (erect herb or suffrutex to lax creeper) and leaf size and shape of leaves (lyratiform to deltoid), the type of trichome and extent of indumentum, the number and size of capitula and the length of the peduncles (Hedberg 1957; Cron 2005). Much of this variation is regional, but there is also altitudinal variation in East Africa. A detailed multivariate analysis of *C. deltoidea* was undertaken (Cron 2005, Cron *et al.* in press), but no recognition of infraspecific taxa was justified. Further field work in Malawi and Zimbabwe was recommended to further investigate the status of the previously recognised *C. buchanani*.

Cineraria gracilis from Ethiopia was distinguished from *C. kilimandscharica* and *C. bracteosa* by having simple (not lyratiform) leaves and the smallness of the whole plant, including the capitula, petioles only slightly widening at the base (Hoffmann 1906). *C. gracilis* is described as having 8 rays, 12 involucral bracts, glabrous cypselae (Hoffmann 1906) and is very likely a form of this very variable species, *C. deltoidea*.

In South Africa, *Cineraria deltoidea* is distinguished from the two other deltoid-leaved species occurring in KwaZulu-Natal, *C. decipiens* and *C. atriplicifolia*, by growth form; these two species are short-lived perennial herbs to lax subshrubs, not perennial creepers. *C. decipiens* has ciliate and hairy cypselae, whereas *C. deltoidea* from KwaZulu-Natal has glabrous cypselae. *C. decipiens* is also usually not as hairy as *C. deltoidea*, having only glandular hairs in the angles of its leaf lobes. It also flowers mainly in the summer months vs. winter months for *C. deltoidea*. The lobing in the leaves of *C. atriplicifolia* is more pronounced, with a distinct apical lobe, about two thirds of the total leaf length. The shape of the auricles differs, being more lanceolate than auriform in *C. decipiens* and *C. atriplicifolia*. Trichomes present in *C. deltoidea*

vary from the long cobwebby type with a narrow base to a tapering granular or agranular base to short eglandular and glandular hairs, the last two occurring in the angles of the leaf lobes (Fig. 2B). Most common in southern Africa is the trichome with a six-celled tapering granular base and a long multi-celled apical appendage (Fig. 3C1).

A manuscript name, *Cineraria paracanescens* Torre *ined.*, based on two specimens from near Hunguéria (Borges 189 LISC, LUA) and Tchivinguiro (Pritchard 361 BM, LISC) in the Huila region of Angola, is possibly also a form of *C. deltoidea*. These specimens have small capitula with only 5 rays, 8 involucral bracts and about 16 disc florets. Their leaves are deltoid to deltoid-reniform, very sparsely cobwebby on the dorsal surface and thinly to thickly cobwebby below due to fine, long trichomes with narrow basal cells and a long apical appendage. All these features are seen in *C. deltoidea*. The margins are coarsely dentate with mucronate tips similar to plants originally named *C. buchanani*, subsequently subsumed into *C. deltoidea*. However, it lacks auricles, unusual for *Cineraria*, and warrants further investigation before it is formally named, if indeed it is a distinct species.

Specimens from Mt Mulanje in Malawi [*Blackmore* 873 (K); *Wild* 6196 (K); *Wild* 6199 (K, PRE); *J. D. & E. G. Chapman* 7566 (K); *Hardy & MacLachlan* 89 (BR, K)] have leaves with a deltoid outline, but they are more deeply lobed and toothed with more lateral pinnae than usual for this species. They have strikingly long ray florets, like some specimens of *Cineraria deltoidea*. More extensive fieldwork in southern Tanzania and Malawi might reveal that the Mt Mulanje specimens are a variant of *C. deltoidea* or a distinct species.

The holotype for *Cineraria deltoidea* Sond. is at S, where Sonder's collection of southern African plants is housed, but its origin was obscured by forgery performed by the amateur botanist Wall, who replaced the original labels with those of his own, 'Herb. Erik Wall' and a fake, imprecise date (B. Nordenstam, *pers. comm.*). Wall's true specimens carry the label 'Erik Wall' and a precise date of collecting (B. Nordenstam, *pers. comm.*). Wall was not in Natal at the time indicated on the *C. deltoidea* specimen and it is a typical example of his forgery. The MEL specimen from herb. Sonder is but a fragment comprising only a single capitulum obscured by a leaf. The specimen at P is not annotated by Sonder, but by Carl Heinrich Schultz (Bipontius). Therefore, the specimen at S has been reinstated as the holotype with a note to that effect.

5. *Cineraria decipiens* Harv. (1865: 312); Hilliard (1977: 378). Type: South Africa, KwaZulu-Natal, Umvoti, *Gerrard & M'Ken* 1040 (holotype TCD!, isotypes BM!, K!, NH!).



Fig. 13. Species of *Cineraria* from tropical Africa: **A** type specimen of *C. mazoensis* var. *granitcola* [Cron & Balkwill 532 (J)], scale bar = 34 mm. **B** type specimen of *C. foliosa* [Goetze 973 (K)], scale bar = 31.3 mm. **C** *C. pulchra*, Castle Beacon, Vumba Mts, scale bar = 18 mm, inset showing leaf detail, scale: 10 mm = 15.5 mm. **D** type specimen of *C. magnicephala* [Pawek 9875 (WAG)], scale bar = 35.5 mm.



Fig. 14. Leaves of *Cineraria*: **A** *Cineraria magnicephala* [Pawek 9875 (WAG)]. **B** *C. alchemilloides* subsp. *alchemilloides* [Maue & Hugo 36 (K)]. **C** *C. lobata* subsp. *lobata*: **C1** upper leaf, **C2** lower leaf [Bolus 8375 (BOL)], **C3** Cron & Goodman 569a (J)]. **D** *C. ngwenyensis* **D1** upper leaf, **D2** lower leaf [Cron & Balkwill 308 (J)]. **E** *C. saxifraga* [Cron & Hodgkiss 370 (J)]. **F** *C. geifolia* [**F1** Cron 314 (J); **F2** Robertson 462 (WAG)]. **G** *C. angulosa* [Hutchinson 289 (K)]. **H** *C. platycarpa*: **H1** upper leaf, **H2, 3** lower leaves [**H1, 3** Dahlstrand 1452 (J), **H2** Cowling 958 (GRA)]. **J** *C. pinnata*: **J1** upper leaf, **J2** lower leaf [Junod 91 (BR), isotype]. **K** *C. parvifolia*: **K1** upper leaf, **K2** lower leaf [Sebola et al. 297 (J)]. Scale bar = 1 cm. DRAWN BY SANDIE BURROWS.

Short-lived perennial herb, up to 0.6 m high. *Stems* herbaceous, woody towards the base, branching, slender, glabrous. Leaves deltoid to hastate in outline, lobed with apical lobe usually about half the total length of lamina, upper leaves distinctly lobed, occasionally dissected; lamina of upper leaves 12–37 × 17–40 mm; lower leaves deltoid, less distinctly lobed; lamina of lower leaves 17–40 × 23–46 mm, glabrous above and below, or sparsely hairy below, mainly on veins, with few hairs in angles of lobes on margins; apex acuminate to acute; margin dentate; base truncate to subcordate, rarely cordate on lower leaves; petiole 7–43(–58) mm long, glabrous to sparsely hairy; auricles lanceolate, dentate, varying in size and persistence, rarely absent. *Capitula* heterogamous, radiate, few (8) to many (18–92) per branch in lax corymbose panicles; peduncles 6–25(–34) mm long, glabrous, bracteate (bracts 1.6–5.0 mm long). *Involucre* calyculate; phyllaries 8–10, rarely 12, 4.0–5.5 mm long, glabrous; margins scarious. *Ray florets* 5 or 6 (rarely also 7 or 8), 4.5–9.0 mm long; limb 3–6 mm long, 4-veined (rarely 6-veined). *Disc florets* (8–) 24–30; corolla 3.2–5.2 mm long. *Cypselae* obovate, compressed, margined, brown, 2.0–2.6 mm long, usually densely (though sometimes sparsely) ciliate on margins and faces, or rarely hairy on faces only. *Pappus* 3.5–4.0 mm long. Fig. 5E.

PHENOLOGY. Flowering from October to February, also occasionally in late September and March.

DISTRIBUTION. South Africa, mainly in KwaZulu-Natal, where it occurs at Tugela Ferry, Ngoye and Mtubatuba in the north, to Umvoti and Oribi Gorge in the south. Also on the border of Swaziland and KwaZulu-Natal (Map 3).

SELECTED COLLECTIONS. SOUTH AFRICA: KwaZulu-Natal, Ingwavuma Distr., Lebombo Range near Gwalaweni Forest, 14 Dec. 1965, *Hilliard* 3266 (NU); Msinga Distr., Tugela Ferry, 5 Feb. 1939, *Galpin* 14778 (K, PRE); Umvoti, *Gerrard & M'Ken* 1040 (holotype TCD, isotypes BM, K, NH); Mtunzini Distr., Ngoye Forest, 12 Oct. 1984, *Lowrey & Van Wyk* 1052 (J, NH); Lowermost Hluhluwe R. valley, 30 May 1976, *Ward* 8858 (K, NH, PRE); Matabetule Plateau, Inanda, 18 Sept. 1987, *Williams* 42 (NH); *Mbonambi* 6 (NH); Oribi Gorge, 6 May 1989, *Cron & Brummer* 5a (J, K, MO, NU); Izotsha Falls, 27 Oct. 1963, *Hilliard* 1916 (NU). **SWAZILAND:** Farm Mlawula, Lebombo Mts, 5 miles SW of Mhlumeni/Goba borderpost, *Culverwell* 813 (PRE); Swaziland: Hhohho Distr.: Malandzela Area, Maphalaleni Road, 16 km from Nyokane turn-off, 28 Jan. 1994, *Braun* 1874 (PRE); *ibidem*, 28 Jan. 1994, *Smook* 8916 (PRE); Swaziland-Natal border, Nsubane Pass from Ingwavuma to Gollell, 16 Dec. 1965, *Hilliard* 3287 (NU).

HABITAT. Rocky grassland and shady places, often on steep south-facing slopes or at the edge of cliffs, and

on the fringe of bush, in forest, on soils derived from sandstone rocks of the Msikaba Formation (Oribi Gorge), from granite domes (Ngoye) or from basalt on the Lebombo Mts; 100–600 m in KwaZulu-Natal; to 1150 m in Swaziland.

CONSERVATION STATUS. Least Concern. Although fairly restricted in distribution and habitat, this species does not qualify as threatened in any of the recognised categories.

NOTES. *Cineraria decipiens* is distinguished from *C. deltoidea* by its growth form, i.e. a short-lived perennial herb, not rambling as the more long-lived *C. deltoidea* does, and by its ciliate and hairy cypselae, vs. glabrous in *C. deltoidea* in KwaZulu-Natal, where it co-occurs. It has lanceolate auricles, which may be conspicuous or very small, whereas those of *C. deltoidea* are distinctly auriform. *C. decipiens* is distinguished from *C. atriplicifolia* by having ciliate and hairy cypselae and the apical lobe tends to be shorter than in that species.

Two types of trichomes are present on *Cineraria decipiens*: (i) glandular capitate trichomes, 6–8 cells long (Fig. 3A); (ii) short eglandular tapering trichomes, 8–10 cells long (Figure 3B2), both mostly in the angles of the lobes of the leaves.

Ward 8858 (K) from near Matubatuba is an unusual specimen with very few disc florets per capitulum and ray florets with very short limbs (1.5–2.0 mm long). Specimens from Swaziland also have small capitula with short rays and unusually narrow involucre bracts (e.g. *Braun* 1874 (PRE) and *Smook* 8916 (PRE) from the Hhohho Distr.). *Compton* 31515 (K, NBG, PRE) from Komati Pass in the Mbabane Distr. has ciliate and hairy cypselae and its auricles match *Cineraria decipiens*, although it appears to be a climber like *C. deltoidea* and has cobwebby axils like *C. lobata* subsp. *southpansbergensis*. *Burt & Hilliard* 3287 (NU) from the Swaziland-KwaZulu-Natal border, Nsubane Pass from Ingwavuma to Gollell (508 m) is fairly typical of *C. decipiens*, but has quite hairy leaves with short eglandular trichomes.

6. *Cineraria huilensis* Cron in Cron *et al.* (2006b: 174). Type: Angola, Huila, Lubango (Sa da Bandeira), Tundavala ao 18 km junto a Fenda, 27 April 1971, *Borges* 89 (holotype LISC!, isotypes BM!, BR!, K!, LUAI, P!, PRE!, SRGH).

Perennial shrublet, to 0.8 m tall. *Stems* woody, branching, lined, tomentose grey, glabrescent. *Leaves* deltoid to deltoid-reniform, shallowly 5–7-lobed; lamina 11–46 × 12–48 mm, usually extremely discoloured, green, cobwebby, glabrescent above, hairs remaining mainly in sunken veins towards base of lamina, thickly tomentose grey or white below, tips

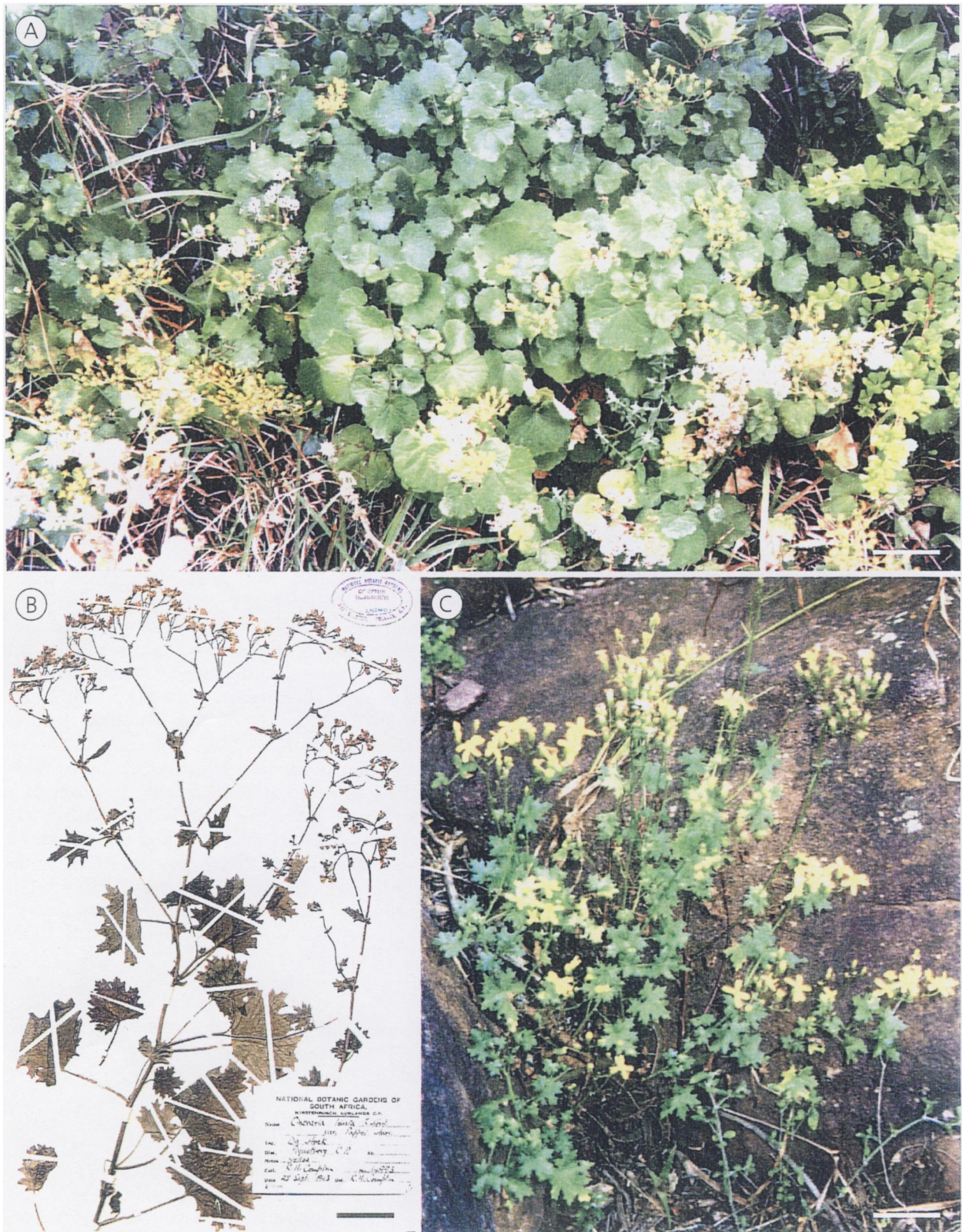


Fig. 15. *Cineraria lobata*: **A** scrambling habit of the compactly, many-headed form of *C. lobata* subsp. *lobata*, Eersterivier, Western Cape, scale bar = 76 mm. **B** *C. lobata* subsp. *lobata* [Compton 14993 (NBG)], the small-headed form from the Western Cape with many small capitula, scale bar = 37 mm. **C** *C. lobata* subsp. *soutpansbergensis*, growing between two large rocks in Venda, Limpopo Province, South Africa, scale bar = 47 mm.

of teeth glabrous (often revolute when dried), veins prominent below; apex acute to obtuse; margin dentate; base subcordate to cordate, occasionally truncate in upper leaves; petiole 6–51 mm long, tomentose grey, occasionally glabrescent; auricles small and caducous or absent. *Capitula* heterogamous, radiate, usually many (26–56 per branch) or occasionally few (10–12 per branch) arranged in a compact (occasionally lax) corymbose panicle; peduncles 3–35 mm long, tomentose to cobwebby, glabrescent somewhat, bracteate, bracts 1–4 mm long. *Involucre* calyculate; phyllaries 8–13, (3.5–)4.0–5.0 mm long, cobwebby, slightly to very glabrescent, or glabrous; margins scarious. *Ray florets* 5–8(–11), (5.4–)6.0–9.0 mm long; limb 3.0–6.5 mm long, 4-veined (occasionally 6-veined). *Disc florets* 20–42(–55); corolla 4.0–5.0 mm long. *Cypselae* obovate, compressed, narrow-winged (to margined), brown, wing sometimes paler brown, 2.2–2.4 mm long, ciliate with sparsely hairy to almost glabrous faces, rarely glabrous. *Pappus* c. 4 mm long. Fig. 5F.

PHENOLOGY. Flowering mainly in April, also in October.

DISTRIBUTION. Angola, Huila Province, in the Serra da Chela mts/plateau, near Lubango (Sa da Bandeira), Humpata, Tchivinguiro and Leba (Map 4).

HABITAT. Growing clustered around rocks and at the base of cliffs, or near rivers on the high plateau, apparently on calcareous schists or associated with granites or quartzites; 1700–2400 m.

CONSERVATION STATUS. Data Deficient. Only a few collections of *Cineraria huilensis* are known, but the area and country as a whole are very under-collected. No formal protection is provided for montane grassland or for the relict pockets of afro-montane forests in Angola (Huntley & Matos 1994).

KNOWN COLLECTIONS. ANGOLA: Huila: Lubango, Tundavala ao 18 km junto a Fenda, 27 April 1971, *Borges* 89 (holotype LISC, isotypes BM, BR, K, P, PRE, SRGH); Lubango (Sa da Bandeira), 5 Aug. 1968, *Brito Teixeira et al.* 12536 (LISC); NW of Lubango on the Chela mts, 30 April 1968, *Kers* 3386 (LISC); Serra da Chela, in the environs of Humpata, Aug. 1937, *Humbert* 16639 (P); Humpata, Buraco do Bimbo, 22 April 1960, *Mendes* 3775 (LISC); Humpata, on the slopes of Leba Hill, 1 April 1972, *Borges* 347 (BM, K, LISC, PRE); Serra da Chela, Tchivinguiro, 15 Oct. 1941, *Gossweiler* 12709 (LISC).

NOTES. *Cineraria huilensis* is a species that shows considerable variation in a number of characters, most notably degree of leaf indumentum, peduncle length, size of capitula and hairiness of the cypselae. All of these features vary within a single gathering in some instances and so cannot reliably be used to separate taxa. Trichomes on the leaves are of the fine, narrow-based cobwebby kind (Fig. 3D1).

Torre originally recognised (but never published) two species, *Cineraria barbosa* and *C. mendesii*, the latter with three varieties (as manuscript names) amongst the specimens included here in *C. huilensis*. Torre distinguished the varieties within '*C. mendesii* ined.' on the basis of indumentum of the leaves, presence or absence of auricles, length of peduncles and indumentum of the cypselae. However, these features are extremely variable even within single gatherings [e.g. *Borges* 89 (BM, BR, K, LISC, P, PRE); *Borges* 347 (BM, K, LISC, PRE)]. Differences in degree of tomentum and size of capitula may simply be due to altitudinal or habitat differences, as seen in other species of *Cineraria*. Further collecting in Angola is needed to fully investigate the variation in this species and before infraspecific names can be applied.

7. *Cineraria mollis* E. Mey. ex DC. (1838: 306); Harv. (1865: 309); Hilliard (1977: 385). Type: Cape, Stormberg, July/Dec. 1835, *Drège* 666 (lectotype designated here G-DC!, isolectotype K!); Graaff-Reinet, 1835, *Ecklon* 433 (syntype G-DC!).

C. arctotideae DC. (1838: 307). Types: Cape, Roggeveld, Great Riet R., *Burchell* 1368 (syntype G-DC!, P!); Sneeuberg, 1835, *Drège* 5904 (syntype G-DC!).

C. polyglossa DC. (1838: 306). Type: Sneeuberg, 1835, *Drège* 5867 (holotype G-DC!).

C. mollis var. *polyglossa* (DC.) Harv. (1865: 309). Type: as above.

Tufted perennial herb from 3 to 20 cm (rarely to 30 cm) tall when flowering. *Stem* a woody, branching rhizome, rooting along its length, tomentose, glabrescent. *Leaves* lyrate-pinnatifid or reniform, frequently with 1–2(–4) pairs of lateral pinnae; lamina of terminal lobe 5–20(–50) × 7–30(–80) mm, usually shallowly 3-lobed, pinnae 9–10 × 4–8 mm, cobwebby grey or glabrous and dark green above, tomentose white or grey below; apex round; margin coarsely dentate or crenate; base cordate (to truncate); petiole up to 150 mm long, tomentose white; auricles absent, though petiole occasionally widens at base, clasping stem. *Capitula* heterogamous, radiate, solitary, or rarely in two, very rarely in threes; peduncles up to 270 mm long, more commonly 65–120(–190) mm long, cobwebby, bracteate (sometimes sparsely), bracts c. 3–4 mm long. *Involucre* calyculate; phyllaries 12–20, 5.5–7.0 mm long, cobwebby, glabrescent, remaining cobwebby towards the base, especially amongst calcylus bracts; margins scarious. *Ray florets* 8–14, 9–13 mm long; limb 5–10 mm long, 4-veined. *Disc florets* c. 52; corolla 4–6 mm long. *Cypselae* narrowly obovate, slightly to fairly compressed, margined, dark brown, 2.8–3.3 mm

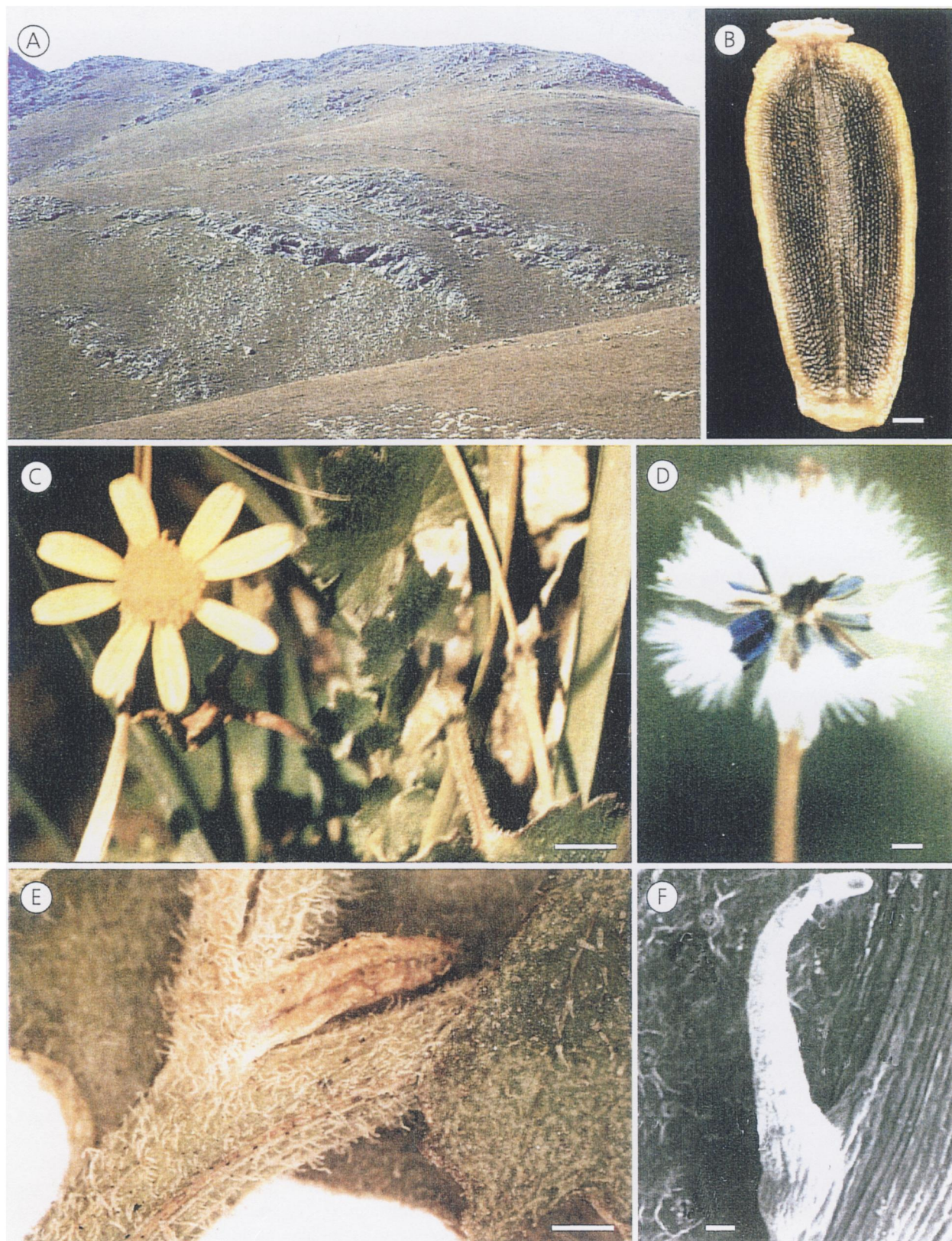


Fig. 16. *Cineraria ngwenyensis*: **A** habitat of *C. ngwenyensis*: quartzite outcrops on Ngwenya Plateau, Swaziland. **B** glabrous cypsela, scale bar = 250 μ m. **C** capitulum and leaves, scale bar = 4.25 mm. **D** mature cypselae with pappus, scale bar = 2.14 mm. **E** lanceolate auricle at base of petiole, scale bar = 1 mm. **F** eglandular trichome on vein on ventral surface of leaf, scale bar = 15 μ m.

long, with white hairs on faces and margins. *Pappus* c. 4 mm long. Fig. 5G, 6A, B.

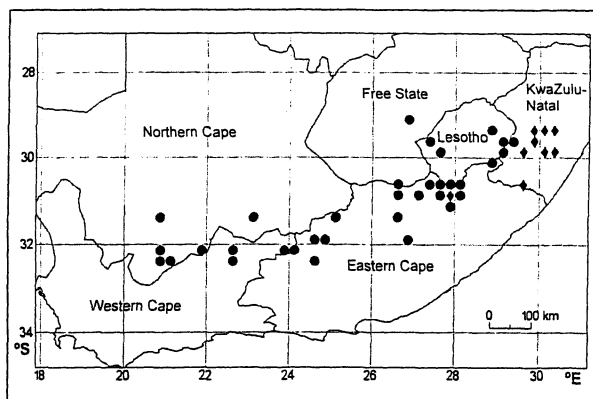
PHENOLOGY. Flowering from October to February.

DISTRIBUTION. Lesotho and South Africa: in the Eastern Cape, from the mountains near Graaff-Reinet to the Witteberg and Naudés Nek in the Southern Drakensberg and the Transkei to the Underberg regions in KwaZulu-Natal and Thaba Nchu in the Free State, and from the Nieuweveld mountains near Beaufort West in the Western Cape (Map 5).

SELECTED COLLECTIONS. **LESOTHO:** Khotoliea, Mt Masite, 1 Nov. 1914, *Dieterlen* 1052 (P); Mafeteng Distr., Ribaneng, 20 Oct. 1946, *Esterhuysen* 13203 (BOL, PRE); 20 km S of Mokhotlong Likaneng, 30 March 1986, *Phillipson* 1445 (PRE); Sehlabathebe Reserve, *Bayliss* 012 (MO, WAG); junction of Legoa and Phororong streams, 27 Oct. 1978, *Hoener* 2075 (NU). **SOUTH AFRICA:** Free State: Thaba Nchu Mt, 23 Jan. 1963, *Roberts* 2361 (PRE); KwaZulu-Natal: 5–7 miles NNW of Castle View Farm, headwaters of Mlahlangubo R., 26 Nov. 1980, *Hilliard & Burt* 13684 (K, NU, S); Underberg, Bushman's Nek, Thamathu Pass, 23 Nov. 1973, *Hilliard & Burt* 7466 (K, NU, PRE, S); Eastern Cape: Witteberg, Joubert's Pass, 18 Jan. 1979, *Hilliard & Burt* 12186 (K, NU, S); Transkei, Ramas Gare, 6 Oct. 1988, *Strever* 1316 (NH); Barkley E Distr., Naudés Nek, 27 Nov. 1971, *Hilliard* 5185 (K, NU, PRE, S); Maclear, Woodcliff Trails, 14 Nov. 1992, *Abbott* 5835 (PRE, PRU); Williston Distr., 20 July 1956, *Acocks* 18860 (K, PRE); Queenstown, Hangklip Mt, 12 Nov. 1893, *Galpin* 1627 (BOL, K, PRE); Stormberg, July/Dec. 1835, *Drège* 666 (lectotype G-DC, isolectotype K); Roggeveld, Great Riet R., *Burchell* 1368 (syntype of *C. arctotidea*, G-DC; P); Sneeuberg, 1835, *Drège* 5904 (syntype of *C. arctotidea* G-DC!); Sneeuberg, 1835, *Drège* 5867 (holotype of *C. polyglossa* G-DC); Graaff-Reinet, 1835, *Ecklon* 433 (syntype G-DC); Graaff Reinet, hills above Valley of Desolation, 28 Nov. 1977, *Hilliard & Burt* 10742 (NU); Graaff Reinet, Koudeveld, Toorberg, 18 Jan. 1963, *Nordenstam* 1945 (S); Solitree, peak N of Worldsvew, Witteberg, 26 July 1986, *Vlok* 1519 (PRE); Elliot Distr., Fetcani Pass, 15 Oct. 1980, *Hilliard & Burt* 13132 (K, NU); Northern Cape: Victoria West, 25 miles N, 17 June 1952, *Acocks* 16408 (PRE); Victoria West dam, 14 May 1976, *Hugo* 315 (PRE); Fraserberg Distr., Layton, Tamboershoek, 2 Nov. 1984, *Shearing* 695 (PRE); Western Cape: Nieuweveld Mts, *Esterhuysen* 2760 (BOL); Beaufort West, Aug. 1894, *Guthrie* 3247 (NBG).

HABITAT. Frequently found growing along the drip line below cave sandstone overhangs and basalt cliffs, or in crevices on cliff faces, often forming mats, also around dolerite rocks; 1600–2550 m.

CONSERVATION STATUS. Least Concern. Fairly widespread, but restricted to specific habitats in localised areas, populations relatively small.



Map 5. Known distribution of *Cineraria mollis* (●) and *C. grandibracteata* (◆).

NOTES. *Cineraria mollis* is a perennial herb with a tufted appearance due to the closely clustered leaves along its woody rhizome (Fig. 6A, B). It is fairly easily identified by its growth form, leaf shape and the solitary (to few) capitula on long peduncles. The dorsal surface of the leaves varies from dark green with a thin cobwebby indumentum to grey with a thicker tomentum of fine, narrow-based long trichomes (Fig. 3D). The ventral surface is usually thickly white woolly or grey.

Drège 666 (G-DC, K) was chosen as the lectotype as both G-DC and K specimens are in good condition, whereas there is only one mature capitulum remaining on the *Ecklon* 433 (G-DC) specimen, although both specimens match the original description.

Specimens from the Victoria West Distr. [*Acocks* 16408 (PRE); *Hugo* 315 (PRE)] and Williston Distr. [*Acocks* 18860 (K, PRE)] are unusual in that the peduncles branch and bear three capitula and their leaves are larger and more dentate or crenate than usual, as in plants previously known as *Cineraria arctotidea*. They occur at a lower altitude than usual for *C. mollis* (1200 m), but otherwise match it well.

Cineraria mollis may be confused with *Bolandia pedunculosa* (DC.) Cron, especially when the leaves are mostly lyrate-pinnatifid, but *Bolandia* has ecalyculate capitula and fusiform heteromorphic cypselae. Species now comprising *Bolandia* were previously included in *Cineraria*, but have pinnately-veined exauriculate leaves and truncate style apices, in addition to the ecalyculate capitula and fusiform cypselae.

8. *Cineraria grandibracteata* *Hilliard* in *Hilliard & Burt* (1982: 248). Type: South Africa, KwaZulu-Natal, Richmond Distr., ridge leading to peak of Byrne, c. 1500 m, 29 April 1976, *Hilliard* 8095 (holotype NU!, isotypes E, K!, M, MO, PRE!, S!).

Perennial herb, to 0.5 m tall. *Stems* weakly woody, simple or branching near the base, often decumbent

at the base and rooting there, tomentose, glabrescent. *Leaves*: upper leaves deltoid reniform to reniform in outline, rarely pinnatifid; lamina 8–26 × 10–33, lower leaves reniform; lamina 9–65 × 12–41 mm, cobwebby and glabrescent above, tomentose below; apex acute; margin dentate; base truncate to deeply cordate; petiole 5–30 mm long, tomentose, especially on younger leaves; usually exauriculate, rarely with small persistent auricles. *Capitula* heterogamous, radiate, solitary, occasionally paired (rarely in 3's) arranged in open corymbs; peduncles (24–)35–130 mm long, thinly tomentose, with conspicuously large bracts subtending peduncle (7–20 mm long). *Involucre* sparsely calyculate; phyllaries 12 or 13, rarely 8 or 10, 5–8 mm long, tomentose, rarely glabrescent near the tips; margins scarious. *Ray florets* (8–11)12–13(–20, rarely as many as 28), 10–14 mm long; limb 6–11 mm long, 4–8(–12)-veined. *Disc florets* (60–)80–90; corolla 6.0–7.5 mm long. *Cypselae* obovate, compressed, margined to narrow-winged, brown, 2–3 mm long, glabrous. *Pappus* to base of disc floret corolla lobes. Fig. 5H, 6C.

PHENOLOGY. Flowering between February and June.

DISTRIBUTION. South Africa: KwaZulu-Natal and Eastern Cape (Map 5).

SELECTED COLLECTIONS. SOUTH AFRICA: KwaZulu-Natal: Kamberg, N-facing slope, 24 May 1973, *Wright* 1507 (NU, S); near Boston, *Medley Wood* 9879 (P); Mpendhle to Nhlosane road, 11 May 1961, *Edwards* 2515 (NU); Marwaqa Peak, April 1889, *Fourcade* (BOL 50369); Lion's R. Distr., Mt Gilboa, 4 May 1977, *Hilliard & Burt* 10327 (K, NU, PRE, S); Umvoti Distr., near Melmoth Farm, Karkloof Nature Reserve, Mt Gilboa, 2 June 1989, *Cron & Scott-Shaw* 10 (J, K, MO); Richmond Distr., Byrne, 29 April 1976, *Hilliard* 8095 (holotype NU, isotypes K, MO, PRE); Richmond Distr., Enon Forest, 9 April 1980, *Van Jaarsveld & Tarr* 5057 (NBG); Eastern Cape: Barkly East, Rhodes, mountain sides, 16 May 1897, *Galpin* 2332 (PRE); Alfred Distr., summit of Mt Ngeli, near Kokstad, Griqualand East, March 1883, *Tyson* 1283 (BOL, NBG); Alfred Distr., Weza, *Coleman* s.n. (NU).

HABITAT. This species grows amongst rocky outcrops and dolerite boulders in grassland on mountain tops or slopes, often in the mist belt, from 450 m in the Kokstad and Weza regions to 1200–1700 m in the Richmond, Lions River and Umvoti Districts, to 1900 m on the mountains near Rhodes in the Barkly East area.

CONSERVATION STATUS. Least Concern, although restricted in distribution and not common, occurring in small populations. The habitat of this species is under some threat from afforestation and inappropriate burning practices by farmers, and the species has therefore been targeted for conservation.

NOTES. *Cineraria grandibracteata* was initially (but not formally) described as 'species B' by Hilliard (1977:

387). *C. grandibracteata* is a slightly straggling herb, supported by other vegetation, often among rock outcrops in grassland. It is fairly easily distinguished from *C. albicans* by its relatively large solitary heads, long peduncles with large bracts and glabrous cypselae (Fig. 6C). It is usually exauriculate, but some specimens have small persistent auricles [e.g. *Tyson* 1283 (BOL, NBG) from the summit of Mt Ngeli; *Coleman* s.n. (NU) from Weza, Alfred Distr.], which also have capitula in twos and threes, not solitary. Other specimens from the Eastern Cape [*Abbott* 5903 (PRU) from Mt Ngeli; *Best* 2537 (PRU) from the Maclear Distr.], have glabrous cypselae and long bracts as in *C. grandibracteata*, but also have fairly large capitula in twos and threes and are auriculate like *C. albicans*. It is possible that they are hybrids.

Trichomes in *Cineraria grandibracteata* are of two main kinds: (i) c. 4 basal agranular tapering cells and a long multi-celled apical appendage (Fig. 3C3); (ii) two narrow basal cells and long apical appendage joined non-obliquely to the basal cells (Fig. 3D1).

9. *Cineraria albicans* N. E. Br. (1895: 39); Hilliard (1977: 385–386). Type: Hort. Kew. ex Hort. W. E. Gumbleton, Queensland, Ireland, originally from seed sent by Mr Adlam of Pietermaritzburg, Natal, South Africa (holotype K!).

Perennial suffrutex, to c. 0.7 m tall. *Stems* woody, branching, thinly tomentose, glabrescent, sometimes decumbent and rooting from point of contact. *Leaves*: upper leaves deltoid to deltoid-reniform to reniform, uppermost often lyrate-pinnatifid, lower leaves reniform to deltoid-reniform, occasionally with lateral pinnae at base; lamina 9–60 × 13–85 mm, cobwebby to thinly tomentose above, often glabrescent, tomentose below, sometimes becoming cobwebby when older; apex obtuse to rounded-obtuse; margin dentate; base subcordate to cordate; petiole 9–51(–82) mm long, tomentose, especially on younger leaves, to cobwebby; auricles usually present, varying in size and persistence, auriform and dentate. *Capitula* heterogamous, radiate, few (to many) arranged in lax corymbs, rarely solitary; peduncles 12–62(–99) mm to point of branching, thinly tomentose to cobwebby, glabrescent, bracteate (bracts 2–13 mm long). *Involucre* calyculate; phyllaries (8–)12–13(–14), 4–7 mm long, persistently tomentose or glabrescent to varying degrees; margins scarious. *Ray florets* 8–13, (7–)8–11 mm long; limb (4.5–)5.5–8 mm long, 4-veined (–7-veined). *Disc florets* 34–60; corolla 4.0–6.5 mm long. *Cypselae* obovate, compressed, margined to narrow-winged, brown, 2.0–3.5 mm long, densely ciliate on margins and faces, to sparsely ciliate and hairy on faces, to ciliate on margins only. *Pappus* as long as disc floret corolla or to base of corolla lobes. Fig. 5J.

PHENOLOGY. Flowering between January and June, rarely in October and December.

DISTRIBUTION. South Africa, in the mountains of KwaZulu-Natal and Eastern Cape (Map 6).

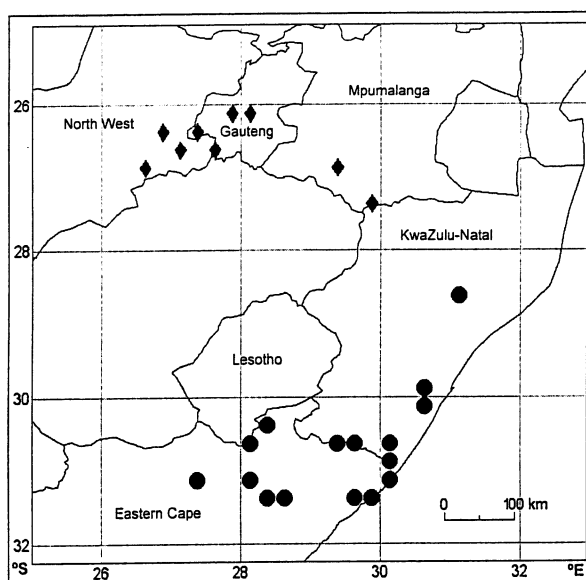
SELECTED COLLECTIONS. SOUTH AFRICA: KwaZulu-Natal: Zululand, Nkandla, 18 April 1956, *Codd* 9687 (MO, PRE, UPS); Nkandla Forest, 4 April 1986, *Jordaan* 754 (K); Ongeluksnek Nature Reserve, 21 Feb. 1999, *Abbott* 7501 (PRU); Maclear Distr., *Galpin* 6712 (PRE); Naudés Nek, Eastern Cape, 13 Feb. 1983, *Hilliard & Burt* 16604 (K, NU, PRE, S, US); Matatiele Distr., Qacha's Nek, *Acocks* 22183 (PRE); East Griqualand, Kokstad, 25 April 1950, *Noberley* 70 (NU); Zuurberg, *Hilliard & Burt* 10204 (MO, NU, S); Richmond Distr., Mid-Illovo, Ismont, 22 April 1981, *Hilliard & Burt* 14485 (K, NU, S); Alfred Distr., Otterburn, 5 Jan. 1969 *Gordon Gray* 6247 (NU); Murchison, 3 May 1884, *Medley Wood* s.n. (BM, BOL 50370); Paddock, 31 Dec. 1965, *Strey* 6264 (NU); Oribi Gorge Nature Reserve, *Balkwill & Cron* 117 (J); Umtamvuna Nature Reserve, Beacon Hill, 1 Jan. 1967, *Strey* 7651 (NU, PRE, S); Eastern Cape: Barkly East Distr., Saalboom Valley, S of Clifford, 21 Jan. 1979, *Hilliard & Burt* 12301 (NU); Maclear, c. 15 km NNW of Ugie, Farm 164, 7 May 1993, *Bester* 535 (NH, PRU); Transkei, Nyameni, 18 May 1969, *Strey* 8621 (NU, PRE); Umtata R. bank, *Pegler* 1600 (BM, PRE); Transkei, near Lusikisiki, Frazer Falls, *Strey* 8545 (K, NU); *Stewart* 1670 (NU); Mkambati Nature Reserve, on hills N of airfield, 9 Dec. 1986, *Nicholas & Smook* 2337 (NH, PRE); Swart R. near Graaff-Reinet, *Maguire* 706 (NBG).

cf. *C. albicans*/*C. erodioides*: SOUTH AFRICA: Eastern Cape: Graaff-Reinet Distr., Farm Rietvlei, bank of Pienaar R., 3 March 1930, *Galpin* 10 001 (PRE); Graaff-Reinet, Hills above Valley of Desolation, 28 Sept. 1977, *Hilliard & Burt* 10741 (K, NU); 10 miles from Graaff-Reinet, on road to Aberdeen, 11 Sept. 1929, *Pole-Evans* 34 (PRE); Graaff-Reinet Distr., Swart R. near Graaff-Reinet, 3 Dec. 1950, *Maguire* 706 (NBG); Graaff-Reinet Distr., near Van Rhyneveld's Pass dam, 27 Feb. 1951, *Theron* 1019 (K); Graaff-Reinet, Sept. – Oct. 1925, *Thode A* 587 (PRE).

HABITAT. *Cineraria albicans* is most frequently found at the tops of gorges at the edge of valley bushveld, usually in rocky outcrops on slopes or near the edge of cliffs and in partial shade, on Natal Group and Msikaba Formation sandstones; 170 – 2600 m.

CONSERVATION STATUS. Least Concern. Fairly widespread and although there is some threat to its habitat by human activities, this species is protected in the Oribi Gorge and Umtamvuna Nature Reserves.

Cineraria albicans is distinguished from *C. grandibracteata* by having smaller and more capitula, as opposed to the solitary capitula of *C. grandibracteata* (rarely in twos) which are subtended by very large bracts (up to 20 mm long) at the base of



Map 6. Known distribution of *Cineraria albicans* (●) and *C. austrotransvaalensis* (◆).

the peduncles, and by its cypselae having some degree of hairiness (never glabrous). Specimens from higher altitude in the Eastern Cape have larger capitula and tend to be very tomentose.

Cineraria albicans may also be confused with *C. erodioides*, but that species has very characteristic procurved auricles and a different type of trichome on the leaves of most specimens: with c. six sharply tapering basal cells and a long apical appendage that often rubs off, leaving the leaves with a slightly scabrid appearance (similar to *C. erosa*). *C. albicans* has trichomes of the fine kind only, with 2 – 4 narrow basal cells and a long apical appendage, attached either obliquely (Figs 2E, 3D1) or non-obliquely (Fig. 3D2). Some specimens from the Graaff-Reinet Distr. are very similar to *C. albicans* in tomentum and have thickly cobwebby involucral bracts, but have auricles like *C. erodioides* [e.g. *Maguire* 706 (NBG), *Theron* 1019 (K), *Galpin* 10001 (PRE)].

10. *Cineraria austrotransvaalensis* Cron (1994: 162). Type: South Africa, Gauteng, Johannesburg, Linksfield Ridge, near Gillooly's Farm, 1550 m, 11 April 1990, *Cron* 19 (holotype J!; isotypes K, MO, PRE!).

Perennial suffrutex, up to 1 m tall. *Stems* woody, branching, tomentose, glabrescent. *Leaves*: upper leaves deltoid-reniform to reniform, usually pinnatifid at base, 11 – 38 × 13 – 53 mm, lower leaves reniform; lamina 10 – 70 × 11 – 91 mm, dorsal surface tomentose (to cobwebby), ventral surface densely tomentose, rarely glabrescent; apex obtuse to rounded-obtuse; margin conspicuously dentate, 6 – 10 teeth per lobe; base cordate to subcordate to truncate; petiole 7 – 62 mm

long, tomentose, glabrescent as leaves mature; auricles large and persistent, auriform. *Capitula* heterogamous, radiate, many arranged in compound corymbs; peduncles 5–31 mm from point of branching, tomentose (to cobwebby), usually glabrescent, bracteate. *Involucre* calyculate; phyllaries 8–13, 4–6 mm long, tomentose, to cobwebby, glabrescent; margins scarious. *Ray florets* 8–10(–12), 7.5–10.5 mm long; limb 4.5–7.5 mm long, 4-veined (–11-veined). *Disc florets* 38–53; corolla 4.5–6.0 mm long. *Cypselae* obovate, compressed, margined to narrowly winged, brown, 2.5–3.2 mm long, ciliate with hairs on faces. *Pappus* to base of disc floret corolla lobes. Figs 6D, 7A.

PHENOLOGY. Flowering mainly between March and June, with rare collections in July, August, October and December.

ILLUSTRATION. Cron (1994: 162).

DISTRIBUTION. In South Africa: Gauteng, North-West Province and at Standerton in southern Mpumalanga (Map 6).

SELECTED COLLECTIONS. SOUTH AFRICA: North-West Province: Ventersdorp Distr., Goedgedacht, 14 April 1931, *Sutton* 589 (PRE); Klerksdorp, near Orford's farm, 10 April 1937, *Phillips* s.n. sub J86830; Klerksdorp, *Convent* 71 (GRA); Elandskraal near Deelkraal, *Botha* 2521 (PRE); Gauteng: Aasvoelkop, Northcliff, 19 April 1930, *Moss* 19033 (BM, J); Northcliff Ridge, 24 June 1950, *Mogg* 19860 (J); Witpoortjie Kloof koppies, 20 April 1924, *Moss* 9518 (J); Strubens Valley, 9 Jan. 1954, *Mogg* 24298 (J); Houtkop 3, Dassiesrand, *Van der Westhuizen* 789 (PRE); 31 Oct. 1944, *Louw* 1083 (PRE); Langerand hills, NNW of Vereeniging, 21 March 1953, *Mogg* 21012 (BOL, J, PRE); Johannesburg, Bez Valley, *Rand* 1279 (BM); On koppies near Johannesburg, *Murray* 563 (PRE); Linksfield Ridge, near Gillooly's Farm, Johannesburg, 11 April 1990, *Cron* 19 (holotype J; isotypes K, MO, PRE); Zoo Koppies, 20 April 1924, *Moss* 9517 (BM); Mpumalanga: Standerton, 1875–1880, *Rehmann* 6825 (K); Roodedraai, 14 Feb. 1994, *Smit* 2907 (PRU).

HABITAT. Amongst rocks on steep slopes of hills and ridges, as well as at the edge of thick bush or under trees; on all aspects and on a range of rock types: quartzite, dolomite and shale; 1400–1700 m.

CONSERVATION STATUS. This species is fairly restricted and fragmented in its distribution and required habitat, although it may be fairly common in its specific habitat, on rocky hillsides. However, many of these habitats are in or adjacent to urban areas in Gauteng and North-West provinces and are highly threatened by development and susceptible to fires caused by vagrants sleeping in the hills. This species is estimated to have an area of occupancy of less than 2000 km² with considerable threat to its habitat,

although the Ridges Protection Policy in Gauteng does offer some protection. The species has therefore been assessed as Orange List and declining. Attempts to cultivate the species in private gardens have been of limited success, as the species is very sensitive to insufficient moisture.

NOTES. *Cineraria austrotransvaalensis* is distinguished from *C. albicans* by a more shrubby, robust growth form, extremely dentate leaves, and shorter peduncles with more capitula, frequently in compound corymbs (Figure 6D). Its trichome complement also differs, having trichomes with c. 6 tapering basal cells and a long multi-celled apical appendage on the dorsal surface of the leaves (Figs 2H, 3C1), vs. the narrow-based fine trichomes found in *C. albicans*. It is more tomentose grey than *C. erodioides* and its auricles are not procurvent, as seen in that species.

11. *Cineraria longipes* S. Moore (1903: 400). Type: South Africa, Gauteng, Johannesburg, Klipriviersberg, April 1903, *R. F. Rand* 1298 (holotype BM!).

Perennial erect herb, up to 0.6 m tall. *Stems* herbaceous, woody towards the base, sometimes branching slightly near the base, green, glabrous, angled and lined. *Leaves* deltoid-reniform to reniform, frequently with 1 or 2 lateral pinnae (especially on uppermost leaves), shallowly lobed; lamina 7–21 × 9–33 mm, glabrous; apex obtuse; margin coarsely dentate (to crenate); base truncate to cuneate or subcordate; petiole 20–73 mm long, glabrous; auricles present, auriform, often inconspicuous. *Capitula* heterogamous, radiate, few (2 or 3) or occasionally as many as 8–12 per stem in a lax corymbose panicle; peduncles 35–108 mm long, glabrous, bracteate, bracts 2–4 mm long. *Involucre* calyculate; phyllaries (11–)13(–14), (5.5–)6–7 mm long, glabrous, green with purplish tips; margins scarious. *Ray florets* 11–13, 9–14 mm long; limb 5.0–9.5 mm long, 4-veined. *Disc florets* 35–50 (–66); corolla 4.0–5.5(–6.0) mm long. *Cypselae* obovate, compressed, with distinct median rib when mature, margined (to narrowly-winged), dark brown to black with paler brown margins, (2.2–)2.5–2.8(–3.1) mm long, glabrous. *Pappus* 4.0–4.5 mm long. Fig. 7B.

PHENOLOGY. Flowering mainly from March to June.

DISTRIBUTION. South Africa, endemic to Gauteng, in the koppies/hills to the south and south-east of Johannesburg, notably in the Klipriviersberg (Map 7).

SELECTED COLLECTIONS. SOUTH AFRICA: Gauteng: Naturena, 6 May 1996, *Cron & Brits* 336 (B, C, CM, E, J, K, M, MO, PRE); Turffontein, *Bayal* D94 (J); Johannesburg, 1908, *Pehrsonn* 5114 (PRE); *ibidem*, 1928, *Young* 985 (J);

upon Klipriviersberg to southward, April 1903, *Rand* 1298 (holotype BM); Thorntree Kloof, Koppies, 13 April 1903, *Moss* 17834 (J); Mondeor, 6 April 1995, *Cron & Balkwill* 302 (E, J, PRE); Suikerbosrand Nature Reserve, 7 May 1998, *Cron, Pfab & Mills* 485 (J, K, PRE); Heidelberg, amongst rocks, April 1927, *Murray* 357 (PRE); Brakfontein 13, 43 miles SE of Johannesburg, 7 miles E of Meyerton, 18 May 1950, *Mogg, Cunliff & Reid* 19562 (J).

HABITAT. In grassland and seeps on south- and south-east-facing slopes of hills, amongst rocks and often associated with *Protea caffra* Meisn., *Cussonia paniculata* Eckl. & Zeyh. and ferns such as *Pteridium* and *Cheilanthes*, Ventersdorp Basic Lava or basalt; 1500–1850 m.

CONSERVATION STATUS. *Cineraria longipes* was previously assessed as Endangered: EN B1ab(i, ii, iii, iv, v)+2ab(i, ii, iii, iv, v)C1+2a(i) (Pfab & Victor 2002), but has been monitored and downgraded to Vulnerable VU D2 (Pfab & Victor *pers. comm.*) as its populations are currently stable. This species is endemic to Gauteng and is threatened by urban development, habitat fragmentation and spread of alien plants, notably blackjacks (*Bidens* spp.) and wattle (*Acacia mearnsii* De Wild.). It has very specific habitat requirements and is fairly restricted in distribution, although it does occur in the Suikerbosrand Nature Reserve and the Klipriviersberg Nature Reserve where it is protected.

NOTES. This species, described by Moore (1903) and based on specimens collected by Rand from the Klipriviersberg, south of Johannesburg, was uncollected for 45 years, until it was rediscovered after a determined search over a number of years in the

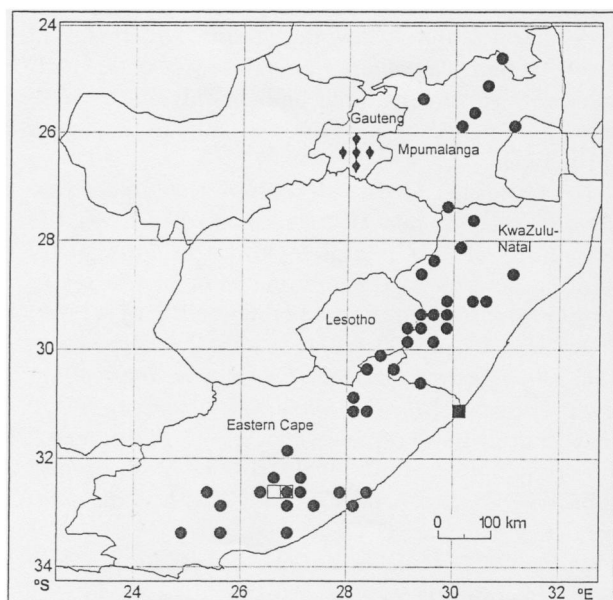
hills in the southern suburbs of Johannesburg. It has since been rediscovered in both the Klipriviersberg Nature Reserve and the Suikerbosrand Nature Reserve, near Heidelberg.

Cineraria longipes is a fairly weak (possibly short-lived) perennial herb, recognisable by its solitary or few capitula on relatively long glabrous peduncles, shallowly-lobed reniform (to deltoid-reniform) leaves with long petioles (Fig. 8A, B). The leaves are entirely glabrous and their base is characteristically cuneate to truncate. It could possibly be confused with *C. lobata*, but has glabrous cypselae, as opposed to the ciliate and hairy cypselae in that species, and generally larger capitula.

Cineraria longipes has been noted to be apparently much liked by cattle [*Bayal D94* (J), Turfontein, April 1919].

12. *Cineraria geraniifolia* DC. (1838: 308); Harv. (1865: 312); Hilliard (1977: 384; 1989: 186). Type: South Africa, Eastern Cape, Albany, Klein-Bruintjieshoogte, 915 m [3000'], 21 Oct. 1829, *Drège* 5902 (lectotype G-DC!; isotypes K!, P!).

Perennial herb, frequently 0.3–0.4 m tall, but may reach 0.8 m in length. *Stems* slender, herbaceous to woody near the base, often decumbent at the base and rooting there, glabrous, or occasionally sparsely hairy, glabrescent. *Leaves* reniform to reniform-pinnatifid to lyrate-pinnatisect (frequently in uppermost leaves), shallowly to deeply (3–)5–7 lobed, often with 1–3 pairs of pinnae below lamina; lamina 6–23(–55) × 7–24(–37) mm, glabrous above or sparsely hairy at base, glabrescent, sparsely hairy to hairy below, mainly on the veins; apex acute to obtuse to rounded; margin coarsely dentate; base subcordate to cordate (to truncate in lamina of lyrate-pinnatisect leaves); petiole 8–41(–80) mm long, hairy to sparsely hairy, glabrescent; auricles usually small, sometimes fairly conspicuous, varying from widening of petiole base to auriform and dentate. *Capitula* heterogamous, radiate, solitary or in two or four's (occasionally as many as 7 or 8) per stem branch; peduncles (15–)21–116(–195) mm long, glabrous, sparsely bracteate, bracts usually 1.5–2.5 mm long, 4–7(–10) mm long at base of peduncle, linear or narrowly lanceolate. *Involucre* calyculate; phyllaries (8–)12–13, (3.5–)4.0–6.0 mm long, glabrous; margins scarious. *Ray florets* (5–)8–13, (6.0–)7.0–14.2 mm long; limb 4.5–11.0 mm long, 4-veined (occasionally 5-veined). *Disc florets* 22–56; corolla 3.5–5.5(–6.0) mm long. *Cypselae* obovate, compressed, often with a prominent median rib when mature, narrow-winged to margined when mature, brown to dark brown, usually with a paler wing, 1.9–3.0 mm long, glabrous. *Pappus* to base of disc corolla lobes. Figs 7C, 8C.



Map 7. Known distribution of *Cineraria longipes* (◆) and *C. geraniifolia* (●), *C. vagans* (□) and *C. dryogeton* (■).

PHENOLOGY. Flowering from September to April in the Eastern Cape and mainly from February to June in KwaZulu-Natal and Mpumalanga.

DISTRIBUTION. South Africa, in the Eastern Cape, from East London through the Amatole Mountains and Katberg to Matatiele in East Griqualand to the southern and central KwaZulu-Natal Drakensberg, the Midlands and Pongola mountains near Utrecht in northern KwaZulu-Natal, to Graskop in Mpumalanga (Map 7).

SELECTED COLLECTIONS. SOUTH AFRICA: Mpumalanga: Graskop Peak, 31 Jan. 1937, *Galpin* 14380 (PRE); Loskop Dam area, Middleburg, *Strey* 3041 (PRE); Lydenburg Distr., Farm De Kuilen, *Krynauw* 303 (PRE); Machadodorp, 20 May 1931, *Young* 1884 (J); Dullstroom-Machadodorp road, 6 April 1994, *Burgoyne* 2382 (J, PRE); Berlin State Forest, about 6 km E of Kaapsehoop, 27 April 1991, *Balkwill, Balkwill & Williamson* 6440 (E, J); KwaZulu-Natal: Drakensberg, Coldstream (Charlestown), 1875–1880, *Rehmann* s.n. (Z); Utrecht, Naauwhoek, 19 March 1978, *Devenish* 1917 (NU); De Beer's Pass, 23 March 1896, *Medley Wood* 5191 (BOL); Bergville Distr., Cathedral Peak Reserve, 20 Feb. 1951, *Killick* 1427 (PRE); Nkandhla, 23 March 1903, *Medley Wood* 8864 (NH); near Mooi R., Lannervean Farm, May 1989, *Cron & Ching* 2 (J, K, MO, NU); Mpendhle Distr., Mulangani, above Carter's Nek, Farm Surprise, 1 April 1985, *Hilliard* 8230 (K, PRE, NU, S); Mashai Pass, Garden Castle Forest Reserve, *Grice* s.n. (NU); Sani Pass, 21 March 1977, *Hilliard & Burt* 9739 (K, MO, NU); Bushman's Nek, *Hilliard & Burt* 17345 (NU); Cobham Forest Reserve, 16 Feb. 1979, *Hilliard & Burt* 12618 (NU); Polela Distr., Farm 'Glengariff', *Rennie* 1132 (NU); Umvoti Distr., near Rietvlei, Gilboa, Mondi Timbers, 27 April 1982, *Burger & Quicke* 8 (NH, PFV); Hills above Greytown, 28 April 1890, *Medley Wood* 4307 (K, Z); Ongeluksnek Nature Reserve, 21 Feb. 1999, *Abbott* 7510 (PRU); Eastern Cape: Maclear, Bushy Ridge Farm, c. 18 km NNW of Ugie, 16 April 1994, *Bester* 2652 (PRU); Maclear Commonage, 15 March 1994, *Bester* 2459 (PRU); Maclear Distr., Midlothian, 20 March 1904, *Galpin* 6708 (GRA, PRE); Bruintjieshoogte, 20 May 1830, *Burchell* 3087 (G-DC, K); Albany Distr., Klein-Bruintjieshoogte, 21 Oct. 1829, *Drège* 5902 (lectotype G-DC; isotypes K, P); Boschberg, 24 Oct. 1980, *Hilliard & Burt* 13228 (K, NU); *ibidem*, Nov. 1867, *Bolus* 1777 (K); Katberg Pass, 26 Jan. 1979, *Hilliard & Burt* 12393 (K, NU); Mt Hope, Upper Zwart Kei, 6 March 1900, *Galpin* 2663 (GRA, PRE); Winterberg Mts, on Adelaide to Tarkastad road, Black Hill, 15 March 1986, *Phillipson* 1333 (MO, PRE, UPS); Amatole Mts, below Tor Doone, 24 March 1985, *Phillipson* 1056 (PRE, UPS); *ibidem*, 5 April 1999, *Cron & Goodman* 563 (J); Honeydale Farm, Fort Hare, 8 Dec. 1976, *Gibbs-Russell* 3107 (GRA, MO, PRE);

Goshen, *Baur* 832 (K); Cathcart, Happy Valley, 17 April 1955, *Johnson* 1261 (GRA, PRE); Mt Thomas, Amatole Mts, 9 Feb. 1986, *Phillipson* 1276 (PRE, UPS); Victoria East, Hogsback, *Johnson* 1187 (PRE); Keiskamma Hoek, Cata Forest Reserve, 12 Feb. 1948, *Story* 3324 (PRE); King Williamstown, *Tyson* 2909 (SAM); near Komgha, Prospect Farm, Dec. 1890, *Flanagan* 692 (BOL, MO, NU, PRE, Z); Kentani Distr., Qolora Mouth, 12 July, *Pegler* 446 (BOL); Gonubie Springs, 11 April 1942, *Compton* 13127 (NBG); Cockscomb, Great Winterhoek, *Esterhuysen* 27109 (BOL, PRE); East London, near Kidd's Beach, 20 Nov. 1945, *Compton* 17794 (BOL, NBG).

HABITAT. *Cineraria geraniifolia* favours moist regimes, frequently growing on damp, grassy slopes and banks of rivers or streams, or in river gorges, also at the foot of cliffs amongst rocks, rarely at the edge of forests and in saline meadows, on loamy or sandy soils derived from dolerite, as well as on basalt in the Drakenberg; growing at sea level near East London in the Eastern Cape, but more commonly between 1300 and 2400 m in the mountains, reaching 2540 m at Sani Pass.

CONSERVATION STATUS. Least Concern. A widespread species, but not common and its populations are small and scattered. Its montane grassland habitat is under considerable threat in regions of KwaZulu-Natal, but it is protected in the Drakensberg catchment areas.

NOTES. *Cineraria geraniifolia* is a widespread and quite variable species, characterised mainly by its slender stems, reniform leaves on relatively long petioles, long peduncles with solitary or few capitula (Fig. 8C) and glabrous, narrow-winged cypselae. The upper leaves tend to become pinnatisect and frequently have lateral pinnae below the lamina, which is then deeply lobed. The leaves are glabrous or sparsely hairy, with short eglandular hairs mainly on the veins below and glandular or eglandular hairs in the angles of the lobes.

De Candolle (1838) described three varieties: *stipulosa*, *oligocephala* and *paniculata* based on the branching of the peduncle and the number of capitula, as well as the indumentum of the leaves (either glabrous or hairy below). Hilliard (1989) designated *Drège* 5902 (G-DC) as the lectotype, (var. β , *C. geraniifolia* var. *oligocephala*), because the type for var. α (*stipulosa*), *Burchell* 5063 (G-DC), was found to have sparsely hairy cypselae and therefore not match the original description for the species. Both *Burchell* 5063 (G-DC) and *Krebs* 170 (G-DC, var. *paniculata*) are better placed in *C. lobata*.

Drège 5902 (G-DC, K, P) comes from Klein Bruintjieshoogte in the Albany district of the Eastern Cape, at an altitude of c. 1000 m, collected flowering in October. It is characterised by shallowly-lobed reniform leaves (rarely with pinnae

below the lamina), long unbranched peduncles with solitary capitula or branching into two only, glabrous cypselae with a narrow wing, and a stoloniferous, slightly woody base off which the stems branch. These specimens are well matched by collections from the nearby Boschberg [Hilliard & Burt 13228 (K); Bolus 1777 (K)], as well as specimens from the Winterhoek [Phillipson 1333 (MO, PRE, UPS)], Goshen [Baur 832 (K)] and Happy Valley near the Hogsback Mts [Johnson 1261 (GRA, PRE)].

There is, however, tremendous variation in the leaves of *Cineraria geraniifolia*, so much so that extreme forms look like a subspecies or even a different species. However, there are sufficient intermediate specimens showing the full range of variation to preclude distinguishing of any unique taxa (e.g. Gibbs-Russell 3107 (GRA, MO, PRE) from Honeydale Farm near Fort Hare and Flanagan 692 (BOL, MO, Z) from Prospect Farm near Komgha in the Eastern Cape). In the most extreme forms, the leaf becomes very pinnatisect with narrow lobes/pinnae. These specimens occur in the Amatole Mts in the Eastern Cape, including the Hogsback [Johnson 1187 (PRE); Cron & Goodman 563 (J), Phillipson 1056 (PRE, UPS)], Mt Thomas [Phillipson 1276 (PRE, UPS)] and Cata Forest Reserve [Story 3324 (PRE)]. Most of these specimens are reportedly from fields that have been heavily grazed or frequently burnt. Some of the low-altitude specimens from Gonubie in the Eastern Cape are also very unusual, with very elongate narrow lobes to their leaves, and they were growing in marshy conditions.

Cineraria geraniifolia in the mountains near Maclear in the Eastern Cape [e.g. Bester 2459 (PRU); Bester 2652 (PRU)] have smaller capitula with 5 rays and 8 involucre bracts, but otherwise match well. They do not have the very large, acutely lobed auricles of *C. dryogeton* from the Umtamvuna Nature Reserve, nor are their leaves as acutely lobed/toothed or hairy.

Plants resembling *Cineraria geraniifolia* in leaf shape and habit, with long peduncles, but with ciliate and sparsely hairy cypselae, have been placed uncertainly/temporarily in *C. erodioides*, as their auricles, though not conspicuous, are procurrent, their trichomes are long and wispy and their ray cypselae often have a broader wing as is common in *C. erodioides* in the Eastern Cape. These include Phillipson 291 (K, PRE) from the mountains south of Cradock; Hilliard & Burt 10573 (NU) and Muller 543 (PRE) from the Mountain Zebra National Park; and Compton 10740 (NBG) from near Oudtshoorn. This area is drier than usual for *C. geraniifolia*, and these plants may well prove to be a distinct variety of either *C. erodioides* or *C. geraniifolia* or perhaps a distinct species.

13. *Cineraria vagans* Hilliard (1989: 186–187). Type: South Africa, Eastern Cape, Katberg Pass, 1677 m [5500'], 24 Jan. 1979, Hilliard & Burt 12356 (holotype E; isotypes K!, NU!, PRE!, S!).

Perennial herb, diffuse, straggling. Stems herbaceous, slender, decumbent, often branching, slightly tuberous and rooting at nodes, glabrous. Leaves reniform, very shallowly lobed, very rarely with a single pinna or pair of pinnae below lamina; lamina 6–13 × 9–25 mm, glabrous, except for a few hairs at base of lamina (especially when young) and in angles of lobes; apex obtuse to rounded; margin coarsely dentate; base cordate, occasionally truncate; petiole 11–73 mm long, very sparsely hairy, glabrescent; auricles reduced to slight widening of base of petiole (mostly in upper leaves), or absent. Capitula heterogamous, radiate, solitary or rarely paired; peduncles (34–)72–200 mm long, glabrous, sparsely bracteate. Involucre calyculate; phyllaries 12 or commonly 13, 4–6 mm long, glabrous; margins scarious. Ray florets (5–)8, 7.0–9.5 mm long; limb 4.5–7.0 mm long, 4(–5)-veined. Disc florets 24–26; corolla 4–5 mm long. Cypselae obovate, compressed, narrow-winged, blackish-brown or brown with paler wing, 2.3–3.0 mm long, glabrous. Pappus to base of disc floret corolla lobes. Fig. 7D.

PHENOLOGY. Flowering December to January.

DISTRIBUTION. South Africa, restricted to the Eastern Cape; notably the Amatole Mts, Katberg Pass and Elandsberg (Map 7).

KNOWN COLLECTIONS. SOUTH AFRICA: Eastern Cape: Stockenström Distr., Katberg Pass, 24 Jan. 1979, Hilliard & Burt 12356 (K, NU, PRE, S); Amatole Mts, Elandsberg, above Farm Coolin, 15 Dec. 1985, Hilliard & Burt 18873 (K, NU); *ibidem*, 26 Jan. 1979, Hilliard & Burt 12393 (K, PRE); *ibidem*, 10 Dec. 1977, Hilliard & Burt 10961 (NU); Elandsberg, 15 Dec. 1985, Phillipson & Hutchings 156 (MO, PRE); Amatole Mts, Nico Malan Pass S of Queenstown, 28 Jan. 1995, Victor & Hoare 541 (PRE).

HABITAT. Prostrate and straggling in grass on slopes or around rocks on rocky outcrops or on ridges, at foot of sandstone cliffs in damp grass, steep south-facing slope, Dohne sourveld grassland; 1380–1750 m.

CONSERVATION STATUS. *Cineraria vagans* is extremely restricted in distribution, very rare, known from only three localities. Its moist grassland habitat in the Eastern Cape is threatened to some extent by overgrazing and inappropriate burning practices. Due to the small area of occurrence and potential for decline, it is considered to be Vulnerable: VU D2.

NOTES. *Cineraria vagans* is very similar to *C. geraniifolia* from which it is distinguished mainly by its diffuse straggling habit, forming small mats, with 'stems rooting at the nodes and these somewhat tuberous'

(Hilliard 1989). The leaves are very shallowly lobed, less so than in *C. geraniifolia*, reniform with deeply cordate bases and only very rarely have pinnae, whereas lateral pinnae are more common in *C. geraniifolia*, especially in KwaZulu-Natal and Mpumalanga. The leaves are almost exauriculate, with only the petiole widening slightly in the middle to upper leaves. Hilliard (1989) noted that the median veins in the disc corolla are pale (vs. reddish brown in *C. geraniifolia*), however this is not a reliable character. For example, Hilliard & Burt 12393 (K, PRE), a good match of *C. vagans* from the type locality, has reddish-brown veins on the ray and disc floret corollas; in contrast Hilliard & Burt 13228 (K) from the Boschberg has pale veins in disc florets of some capitula, but reddish-brown veins in florets from other capitula and matches *C. geraniifolia* well.

The leaves of *Cineraria vagans* have only a few eglandular trichomes (Fig. 3B3) in the angles of their lobes and at the base of the lamina when young. These trichomes do not appear to be as long as the kind seen in *C. geraniifolia*.

The number of ray florets in *Cineraria vagans* ranges from 5 to 8, most frequently 7 or 8. *C. geraniifolia*, differs by having larger capitula commonly with between 8 and 13 rays, but some high altitude forms from the mountain peaks in the Eastern Cape have 5 rays. A number of morphological differences do exist between them, but *C. geraniifolia* is quite variable and this species may be a part of that variation. Molecular studies are needed to confirm that *C. vagans* is indeed a distinct species from *C. geraniifolia*.

14. *Cineraria dryogeton* Cron in Cron *et al.* (2006a: 35). Type: South Africa, KwaZulu-Natal, Umtamvuna Gorge, near Umfazo Falls, 282 m, 8 March 2001, Abbott 7809 (holotype PRU!; isotypes J!, K!, NH!).

Annual or short-lived perennial herb, reaching a height of about 1.0 m. *Stems* herbaceous, slender, becoming slightly woody near base, unbranched (or rarely multi-stemmed, branching from the base), very densely hairy, c. 2.0 mm in diameter near base. *Leaves* sagittate to reniform in outline, distinctly 3- or 5-lobed, occasionally with a pair of lateral pinnae; lamina 10–19 × (7–)17–32 mm, (uppermost leaves small and bract-like), green, densely hairy above and below; apex acute; margin with sharply acute, large teeth; base sagittate to cordate; petiole (3–)8–25 mm long, densely hairy; with conspicuous, sharply toothed auricles. *Capitula* heterogamous, radiate, few, 2–8 per stem branch in a lax corymb; terminal peduncles 24–60(–90) mm long, glabrous, sparsely bracteate near capitula, bracts 1.5–2.0(–4.0) mm long. *Involucre* calyculate; phyllaries 8, 5.0–5.5 mm long, glabrous;

margins scarious. *Ray florets* 5 or 6 (rarely 7 or 8), 7.0–9.0 mm long; limb 5.0–7.0 mm long, 4-veined. *Disc florets* c. 18–20; corolla 4.5–5.0 mm long. *Cypselae* narrowly obovate, compressed, brown with paler margins, 2.0 mm long, glabrous. *Pappus* to base of lobes of disc floret corolla. Figs 7E, 8D.

PHENOLOGY. Flowering in March and April.

DISTRIBUTION. Endemic to the Umtamvuna Nature Reserve (and possibly similar sandstone gorges in the region) in KwaZulu-Natal and the Eastern Cape, South Africa (Map 7).

KNOWN COLLECTIONS. South Africa: Umtamvuna Nature Reserve, near Umfazo Falls, 1 April 1984, Abbott 1885 (NH, PRU); *ibidem*, 8 March 2001, Abbott 7809 (holotype PRU; isotypes J, K, NH); Umtamvuna Nature Reserve, Chestnut Grove, 24 March 1984, Abbott 1874 (UNR); Umtamvuna Nature Reserve, Hazel Ridge, 22 March 1984, Abbott 1854 (UNR).

HABITAT. In grassland near forest margin, and forest margin near waterfall, in sandy-loam soil, sandstones of the Msikaba Formation; altitude: 300–400 m.

CONSERVATION STATUS. A rare species, with a very restricted distribution, known only from two localities in the Umtamvuna Nature Reserve. *Cineraria dryogeton* is very likely an endemic to this forest or similar forests in the Pondoland region. These small remaining patches of forest are under intense human pressure and much of the grassland in the Pondoland Centre has been floristically depleted or destroyed by anthropogenic activities (Van Wyk 1993; Abbott *et al.* 2000). This species is therefore assessed as Endangered: EN B2ab(iii) (Cron *et al.* 2006a).

NOTES. *Cineraria dryogeton* shows an affinity with *C. geraniifolia* in its growth form and leaf shape, but differs markedly in the dense covering of hairs on its stems and leaves. *C. geraniifolia* is typically a multi-stemmed (though slender) perennial herb with reniform, lobed leaves and two or three fairly large capitula on long peduncles, with 8–13 rays and 12 or 13 involucre bracts. In contrast, *C. dryogeton* appears to be a single-stemmed trailing annual or biennial herb (Fig. 8D), with smaller capitula with 5 (rarely 7 or 8) rays and 8 involucre bracts. The auricles also differ, being much more sharply toothed and deeply dissected and conspicuous in *C. dryogeton* than in *C. geraniifolia*.

15. *Cineraria anampoza* (Baker) Baker (1887: 496); Humbert (1923: 217); Humbert (1963: 824). Type: Central Madagascar, forests of Imerina, Jan. 1882, Baron 1234 (lectotype designated here K!, isolectotype BM!; syntypes Central Madagascar, forests of Imerina, Baron 1271 K!, *ibidem*, Baron 2113 K!, *ibidem*, Feb. 1882, Parker s.n. K!).

Senecio anampoza Baker (1883: 191). Types: as above.

Senecio hygrophilus Klatt (1890: 26). Type: Madagascar,

Betsiléo, Jan. 1881, *Hildebrandt* 3885 (neotype designated here K!, isoneotype BM!).

Cineraria hygrophila (Klatt) Klatt (1892: 299); Humbert (1923: 217). Type: as for *S. hygrophilus*.

Perennial herb, 40–65 cm tall. *Stems* herbaceous, woody towards the base, branching, glabrous. *Leaves* deltoid to deltoid-reniform in upper leaves, deltoid-reniform to reniform in lower leaves, shallowly lobed, occasionally with two lateral pinnae, uppermost bract-like leaves sometimes lyrate-pinnatifid; lamina 5–19 × 4–35 mm, green, glabrous above, sparsely hairy on veins below or rarely glabrous; apex obtuse; margin broadly dentate; base cuneate to truncate to subcordate in upper to middle leaves, subcordate to cordate in lower leaves; petiole 7–38 mm long (1 to 3 times length of lamina), sparsely hairy or glabrous; auricles small, auriculate, persistent or caducous. *Capitula* heterogamous, radiate (rays rudimentary or well-developed), few (4–8) to many (30–40) per stem in lax terminal corymbose panicles; peduncles 10–60(–90) mm long, glabrous, minutely bracteate. *Involucre* calyculate; phyllaries 11–15, frequently 13, (5–)6–7 mm long, (narrow), glabrous; margins with narrow scarious margins. *Ray florets* 7 or 8, 5.0–7.5 mm long; limb 2.0–4.5 mm long, 4-veined. *Disc florets* 22–30; corolla 4.0–5.5 mm long. *Cypselae* obovate, compressed, narrow to broad-winged (broader wing evident on outer cypselae), mature cypselae black with brown wing, 2.8–3.0 mm long, sparsely hairy to hairy on both faces (f. *anampoza*), or hairy on the outer face only and glabrous on the inner face or occasionally glabrous on both faces (f. *hygrophila*), occasionally with a few hairs on shoulders of wings. *Pappus* as long as disc floret corolla. Fig. 7F.

PHENOLOGY. Flowering all year round, but mainly from December to April.

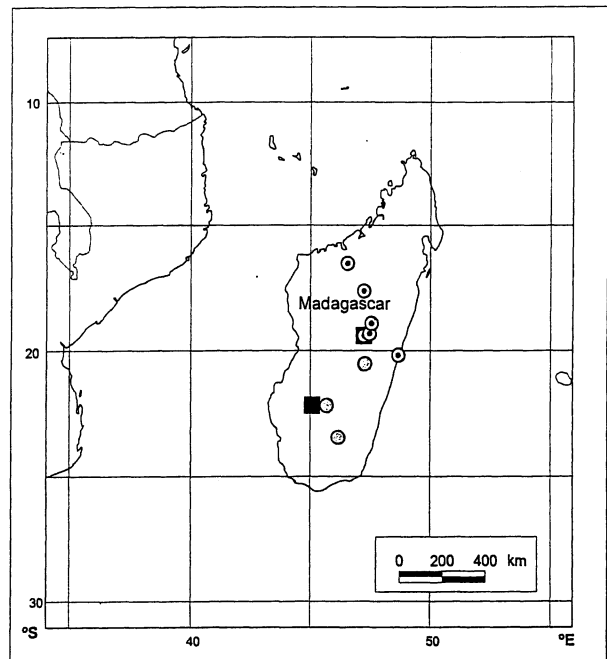
ILLUSTRATION. Humbert (1963: 825, Fig. 152).

DISTRIBUTION. Madagascar: Central Madagascar, NE of Imerina, around Tananarive, forests of Andasibe, Ankaratra massif, south-Betsileo (Map 8).

SPECIMENS INTERMEDIATE BETWEEN THE TWO FORMS. Near Antananarivo, *Bosser* 6084; Ankaratra Mts, *Humbert* 4545 (E, K); Mt Antety near Ambositra, *Humbert & Swingle* 4717 (BM, US); Botanical Gardens Tananarive, April 1923, *Waterlot* 756 (PRE, S); in the region of Ambatofitorhana (Betsileo), 300 km on the route Antananarivo-Fianarantsoa, 22 Jan. 1955, *Humbert & Capuron* 30217 (K!).

Additional transitional specimens listed by Humbert (1963), not seen by the authors: Antsirabe, *Perrier* 3409; Kalambatitra, SE of Betroka, *Humbert* 11967.

HABITAT. In damp, shady places, near and in forests, among grasses on forest track, along mountain streams, on soils derived from quartzites; or on clay and laterites; 1200–2600 m.



Map 8. Known distribution of *Cineraria anampoza*: f. *anampoza* (○), f. *hygrophila* (■) and intermediates between the two forms (⊙).

CONSERVATION STATUS. Data Deficient. This species is very likely threatened as indigenous forest in Madagascar has been greatly diminished. (*Phillipson* 1604 (BR, K, WAG) notes that it is a weedy perennial.)

LOCAL NAMES. Ampoza, anampoza vavy (near Imerina).

NOTES. Baker (1883) first described this species as a *Senecio*, but transferred it to *Cineraria* (Baker 1887) on seeing the mature flattened and winged cypselae on *Baron* 4254 (E, K). He noted that it appeared to be in the vicinity of *C. geraniifolia*, possibly due to some similarity in leaf shape, but *C. geraniifolia* has far fewer capitula on much longer peduncles. Humbert (1963) recognised two subspecies based mainly on the length of the ray floret ligules and indumentum of the cypselae, subsuming *C. hygrophila* (= *Senecio hygrophilus*) into *C. anampoza* as subvar. *hygrophila*. There is however some overlap between them with a number of intermediate specimens occurring near Antananarive and Ambositra and their distribution also overlaps considerably (Humbert 1923: 217). They are therefore reduced here to forms.

Baker 1234 (K) has been chosen as the lectotype as it is more representative of the whole plant; *Baker* 1271 (K) has fewer leaves (and mainly upper leaves) and *Baker* 2113 (K) has no remaining capitula. A neotype is chosen for *Senecio hygrophilus* (the basionym of *Cineraria anampoza* f. *hygrophila*) as the original [*Klatt* 3885 (B†), also from Betsiléo, Jan. 1881] has been destroyed.

Key to forms of *Cineraria anampoza*

- Rudimentary limb on ray florets (limb 2.0 – 2.5 mm long); cypselae hairy on faces and margins f. **anampoza**
 Limbs of ray florets well developed (limb 5 – 7 mm long); cypselae glabrous on the inner face,
 hairy or glabrous on outer face f. **hygrophila**

Cineraria anampoza (Baker) Baker forma **anampoza** stat. nov.

Ray florets rudimentary, 5 – 5.5 mm long; limb 2.0 – 2.5 mm long. *Cypselae* sparsely hairy to hairy on both faces.

SELECTED COLLECTIONS. MADAGASCAR: Central Madagascar, Jan. 1882, *Baron* 1234 (lectotype K, isolectotype BM); *ibidem*, Oct. 1882, *Baron* 1271 (K); *ibidem*, Oct. 1882, *Baron* 2113 (K); *ibidem*, Dec. 1885, *Baron* 4254 (E, K); *ibidem*, Dec. 1883, *Baron* 2438 (K); Manjakatempo Forestry Station, April 1947, *Humbert* 20835 (K); Antananarivo, E slope of Ankaratra, W of Ambatolamy Forest Reserve, 11 March 1987, *Phillipson* 1604 (BR, K, WAG); Vakinankaratra, Ansirabe Province, Tombaina, *Waterlot* 756 (PRE, S); Massif de L'Ankaratra: E side of Tsiafajavona, 15 July 1928, *Decary*, *Humbert* & *Swingle* 4545 (K).

Cineraria anampoza (Baker) Baker forma **hygrophila** (Klatt) Cron stat. nov.

C. anampoza (Baker) Baker subvar. *hygrophila* (Klatt) *Humbert* (1963: 826).

Ray florets 6.0 – 7.0 mm long; limb 3.0 – 4.5 mm long. *Cypselae* hairy on the outer face only and glabrous on the inner face or occasionally glabrous on both faces, occasionally with a few hairs on shoulders of wings.

SELECTED COLLECTIONS. MADAGASCAR: Ankaratra Mts, *Catat* 303; Ankaratra Mts, *Decary* 13423; Ankaratra Mts, *Waterlot* 716 (PRE); Betsiléo, Jan. 1881, *Hildebrandt* 3885 (neotype K; isoneotype BM).

16. *Cineraria erodioides* DC. (1838: 307); Harv. (1865: 310). Type: South Africa: Eastern Cape, Uitenhage, Olifantshoek (Alexandria), between the mouth and banks of Boschmansrivier (Boesmansrivier), under 92 m [300'], Oct., *Ecklon* & *Zeyher* 467 (holotype G-DC!; isotypes P!, S!).

Cineraria tussilaginea Thunb. (1823: 671) *pro parte* excl. *C. tussilaginis* L'Hér. et typus; *synon. fide* Harvey (1865: 310). Type: South Africa, *Thunberg* 19937 (holotype UPS-THUNB!).

Cineraria dieterlenii E. Phillips (1917: 143); Hilliard 383 (1977: 383); *synon. nov.* Type: Lesotho, Hlotse

(Leribe) Plateau, March 1915, *Dieterlen* 576 (holotype PRE!, isotypes BM!, NBG!, NH!, P!, Z!).

Cineraria britteniae Hutch. & R. A. Dyer in Dyer (1934: 266); Hilliard (1977: 380); *synon. nov.* Type: South Africa, Eastern Cape, Albany Division, Signal Hill near Grahamstown, 25 Dec. 1926, *Britten* 5550 (holotype GRA!; isotypes K!, PRE!).

Cineraria polycephala DC. (1838: 307); Harv. (1865: 310); *synon. nov.* Type: South Africa, Western Cape, Visbaai, near Mossel Bay, c. 30 m [100'], Aug. 1831, *Drège* 5903 (holotype G-DC!; isotypes P!, fragments K!, S!).

Perennial suffrutex, to c. 1 m tall, occasionally taller if straggling through surrounding vegetation. *Stems* herbaceous to woody at the base, erect, branching, cobwebby to softly hairy, glabrescent (to glabrous in some low-altitude forms in the Eastern Cape). *Leaves* reniform to deltoid-reniform in outline, (occasionally to deltoid in uppermost leaves), shallowly to deeply lobed, 5 – 7-lobed, sometimes with lateral pinnae below lamina; lamina 10 × 50(–70) – 10 × 71(–90) mm, thinly cobwebby to glabrescent or sparsely hairy or glabrous above, (thinly to) thickly cobwebby or sparsely hairy or hairy below, glabrescent, young leaves often white woolly or rarely grey-canescens above and tomentose white or grey below (var. *tomentosa*); apex rounded to obtuse; margin dentate; base truncate to subcordate to cordate; petiole 4 – 64 (–95) mm long, cobwebby or sparsely hairy to hairy; auricles usually very conspicuous, auriform, dentate and characteristically running up petiole to varying degrees. *Capitula* heterogamous, radiate, few (4 – 12) to many (18 – 96) per stem branch arranged in fairly lax corymbose panicles; peduncles (3 –)5 – 27(–41) mm long, occasionally longer (to 72 mm) in high altitude forms with large capitula, cobwebby, glabrescent, or sparsely hairy, occasionally glabrous, bracteate. *Involucre* calyculate; phyllaries 8 – 13, (3 –) 4 – 5 mm long, glabrous or cobwebby, glabrescent, often remaining cobwebby only at base amongst calyculus bracts; margins scarious. *Ray florets* 5 – 8(–13), 5.5 – 9.0 mm long; limb 3.0 – 6.5 mm long, 4(–5)-veined. *Disc florets* (20 –)25 – 40(–80) (rarely as few as c. 14 in low altitude forms); corolla (3.0 –)3.5 – 5.0 mm long. *Cypselae* obovate, compressed, winged, with a distinct, pale narrow wing (or broad wing, especially on rays), to distinctly margined, then

appearing narrow-winged when younger, dark brown with paler brown wing or margin, (2.0–)2.5–2.8 mm long, ciliate with sparsely hairy or glabrous faces or entirely glabrous (occasionally with a few hairs on 'shoulders'). *Pappus* 3–4 mm long. Figs 7G, 9.

PHENOLOGY. Flowering all year round, but mainly from January to May.

ILLUSTRATION. Fig. 9, Fig. 10A, B.

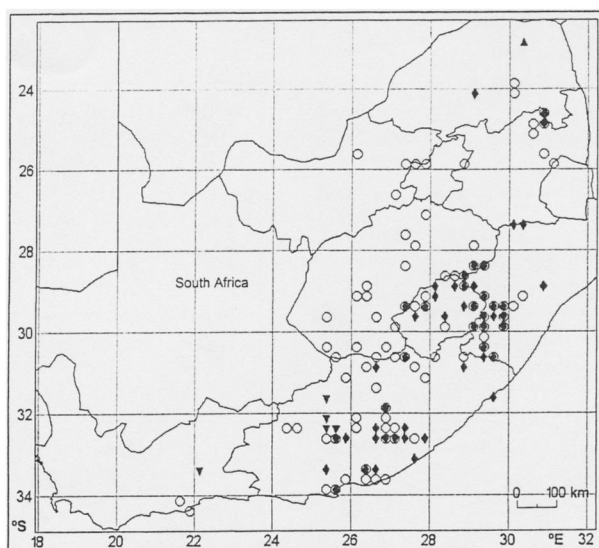
DISTRIBUTION. A widespread, highly variable species, occurring in Uitenhage and surrounding low altitude regions of the Eastern Cape into the Eastern Cape mountains, e.g. the Witteberg, southern Drakensberg, and Great Winterberg into Lesotho and eastern Free State, also in the foothills of the Drakensberg in KwaZulu-Natal, from regions surrounding Kokstad and Underberg to Van Reenen, northwards to the Transvaal Drakensberg in Mpumalanga, including the Blyde River Canyon and Mariepskop, the Wolkberg in Limpopo Province and the Magaliesberg in North-West Province and Gauteng. A few isolated collections from the Western Cape are also known (Map 9).

HABITAT. Often growing near rivers, usually on mountain slopes or plateaux, also at road sides and margins of woods, in amongst coarse grass tussocks on wet slopes, sandstone outcrops and boulders, on basalt; from under 100 m in the Eastern Cape to 3300 m in Lesotho (Mont Aux Sources).

CONSERVATION STATUS. Least Concern. Very widely distributed in South Africa and Lesotho and locally common in the right habitat.

NOTES. *Cineraria erodioides* is a highly variable species, characterised mainly by deltoid-reniform to reniform leaves with very conspicuous auricles clasping the stem and running up the petiole on some of the leaves, notably the uppermost ones. The complement of leaf trichomes is also a useful aid to identifying this species: fine, cobwebby trichomes above (Fig. 3D) and trichomes with c. 6 tapering basal cells and a long, multi-celled apical appendage (Fig. 3C) on the ventral surface (and sometimes also dorsally). A few specimens from the Eastern Cape, Free State and North-West provinces have fine cobwebby trichomes above and below. The cypselae have a distinct wing (often paler than the body of the cypselae), which tends to become broad in plants growing at low altitude in the Eastern Cape. The cypselae commonly have a ciliate wing, with faces glabrous or sparsely hairy, or are rarely entirely glabrous.

There is also considerable variation in the degree of lobing, bushiness, and the presence of the characteristic auricles running up the stem (although all are auriculate to some degree). The type specimens of *C. erodioides* are themselves quite variable in terms of leaf shape, with the Paris isotype lacking the very characteristic auricles and being more lobed than the other two types, but matching in



Map 9. Known distribution of *Cineraria erodioides* var. *erodioides* (○ with ciliate cypselae, ◆ with glabrous cypselae) and *C. erodioides* var. *tomentosa* (▲); *C. cf. erodioides* with long peduncles (▼).

other respects. Good matches of the type specimen from Uitenhage (Eastern Cape) at low altitude are: *Long* 16 (GRA, K) from Bethalsdorp, *Britten* 2838 (GRA) and *Acocks* 18322 (PRE) both from the Bathurst District and *Olivier* 1216 (NBG) from the Baakens River, Fern Glen. Although the type is thickly cobwebby on the lower surface of the leaves, it appears that there is a tendency for the plants growing at low altitude to be more glabrescent and have finer trichomes limited to the young leaves, remaining at the base of the lamina of older leaves and in the axils of the petioles.

Cineraria erodioides was originally collected from near the mouth of the Boschmans River in the Uitenhage District of the Eastern Cape, at low altitude by Ecklon and Zeyher. However, it occurs much more commonly at higher altitude, with the type well matched by specimens from the southern Drakensberg (near Rhodes) in the Eastern Cape, viz. *Hilliard & Burt* 16603 (K, NU, PRE, S), *Hilliard & Burt* 16434 (MO, NU, S), *Hilliard & Burt* 6727 (MO, NU, S), as well as *Bayliss* BS.1303 (GRA, MO, PRE, S, WAG, Z) from Sehlabathebe, Lesotho. These high altitude plants tend to have larger capitula with 8–12 rays as opposed to the 5 rays in the type specimens (G-DC, P and S). However, this trend is not without exception, as seen in the study of populations from the Witteberg and Naudé's Nek, e.g. *Cron & Goodman* 559 (J) from the summit of Naudé's Nek has 5–8 rays (Table 1).

The currently known distribution of *Cineraria erodioides* now extends from the lower altitudes of the Western Cape and Eastern Cape into the high southern Drakensberg as well as into KwaZulu-Natal,

Table 1. Study of the variation in populations of *Cineraria erodioides* along Joubert's Pass in the Witteberg and at Naudé's Nek, Eastern Cape.

Specimen/ Collection	Locality & Habitat	Altitude (m)	Habit	Lamina length × width, smallest – largest (mm)	Number of Ray florets	Length of Ray floret limb (mm)	Number of Involucral bracts
<i>Cron & Goodman</i> 538 (J, E, K, MO, S)	Witteberg, Joubert's Pass; in sun	2100	Sprawling shrublet, 50 cm tall	7 – 24 × 8 – 35	8	5 – 6	13
<i>Cron & Goodman</i> 539 (J, B)	Witteberg, Joubert's Pass; in shade	2100	Spreading suffrutex	7 – 34 × 10 – 55	8	5 – 8	11 – 13
<i>Cron & Goodman</i> 546 (J)	Witteberg, Joubert's Pass; amongst rocks	2200	Erect herb, c. 30 cm tall	6 – 17 × 5 – 23	8	5 – 7	10 – 12
<i>Cron & Goodman</i> 552 (E, J)	Naudé's Nek; amongst rocks	2200	Erect herb	10 – 20 × 11– 30 (uppermost pinnatifid)	7; 8	5 – 7	12 – 13
<i>Cron & Goodman</i> 554 (J, E, K, MO)	Naudé's Nek; in shade of rocks	2200	Shrublet, c. 30 cm tall	5 – 17 × 8 – 22	12	6 – 7	12
<i>Cron & Goodman</i> 555 (J)	Naudé's Nek; shade of rocks	2200	Single-stemmed, erect herb	8 – 22 × 10 – 37	8	6 – 8	12
<i>Cron & Goodman</i> 559 (J)	Naudé's Nek; near summit, in shade, amongst rocks	2600	Suffrutex to c. 30 cm	7 – 14 × 8 – 19	5; 7; 8	5.5 – 8	10 – 13

the eastern Free State, North West Province, Gauteng, Mpumalanga and Limpopo provinces in South Africa. It also occurs at very high altitude in Lesotho (e.g. 2900 m at Mont Aux Sources and Mahlasela Pass), reportedly reaching 3600 m on the Sentinel. These high altitude plants were previously thought to be a distinct form of *C. geifolia* (Hilliard 1977). Many of them have the distinctive auricles of *C. erodioides*, although their leaves tend to be more shallowly lobed than usual and they generally have larger capitula. A study of the variation amongst these specimens in terms of depth of leaf lobing, size of capitula and cypselae indumentum (Table 2) revealed no justification for recognising it as a distinct taxon at any level.

The range of variation seen in *Cineraria erodioides* also includes plants previously known as *C. dieterlenii*, mainly from KwaZulu-Natal, but extending along the 'Transvaal Drakensberg' into Mpumalanga and Limpopo provinces. Although the type specimens of *C. dieterlenii* [*Dieterlen* 567 (P, PRE, NBG, NH, Z)] from Hlotse (Leribe), Lesotho all have glabrous cypselae, other similar specimens (e.g. *Dieterlen* 576b (PRE) from Maboloka Mt, Lesotho) have cypselae with ciliate margins and hairy faces. Specimens from Mariepskop

(at the northern end of the Transvaal Drakensberg escarpment) with deeply lobed, reniform (to deltoid-reniform) leaves, usually with rounded sinuses between lobes, 5 – 8 rays, 8 (–10) involucre bracts, and ciliate and hairy cypselae were originally thought to be a distinct taxon, but they match plants previously known as *C. dieterlenii* well and therefore are considered to be part of *C. erodioides*.

Cineraria erodioides also includes specimens with the manuscript name of *C. fruticetorum* Taylor (a name adopted by a number of herbaria). These match plants previously known as *C. dieterlenii*, showing similar variation in indumentum of cypselae [e.g. *Tyson* 1147 from Mount Currie has cypselae sparsely hairy and sparsely ciliate to ciliate (PRE) to glabrous except for a few hairs on margins of some (BOL & K); *Tyson* 1502 (BOL) and *Tyson* 1483 (BOL, PRE) from the same locality have entirely glabrous cypselae].

There are no differences between *Cineraria britteniae* from the Eastern Cape and *C. erodioides*, when the range of variation in *C. erodioides* is taken into consideration. This species was described by Hutchinson & Dyer (Dyer 1934) and the name was applied to plants restricted to the Albany Division near Grahamstown in the Eastern Cape, as well as in

Table 2. Summary of variation in *Cineraria erodioides* with large capitula at high altitude in terms of degree of leaf lobing (average of three or four measurements), number of ray florets and involucre bracts and cypselas indumentum.

Specimen	Locality & Grid Reference (Quarter Degree Square: QDS)	Altitude (m)	Leaf lobing Average apical lobe: lamina length ratio	Number of Ray florets	Number of Involucre bracts	Cypselas indumentum
Phillipson 1383 (MO, PRE)	Moteng Pass 2828DC	2400	Shallow 0.20	8 – 13	13	V. sparsely hairy + ciliate (MO) /glabrous (PRE)
Schelppe 1328 (NU)	Mont Aux Sources 2828DD	2960	Fairly shallow 0.25 topmost 0.40	10 – 12	10 – 12	Glabrous
Schelppe 1281 (NU)	Mont Aux Sources 2828DD	2835	Shallow 0.21	14	12	Glabrous
Phillipson 1405 (K, MO, PRE)	Mahlasela Pass 2828DC	2900	Shallow topmost 0.39, rest 0.18	12, 13	12, 13	Glabrous (to sparsely hairy on a few MO)
Evans 1357 (K, NH, PRE)	Mont Aux Sources 2828DB		Distinctly lobed (+ pinnae) 0.36	12, 13	12, 13	Glabrous
Steyn 6092 (NBG, PRE)	Sentinel 2828DB		Distinctly lobed 0.36	10	13 (+)	Glabrous
Liebenberg 8152 (K, PRE, WAG)	'Gully' 2828DB	3050	Distinctly lobed 0.39	12, 13	13	Glabrous
Jacobsz 3108 (PRE)	Zigzag Pass, Platberg 2829AC	1900	Distinctly lobed, (+ pinnae) sharp teeth 0.41	12, 13	13	Glabrous
Trauseld 213 (NU, PRE)	Mont Aux Sources 2828DD		Distinctly lobed, (+ pinnae) sharp teeth 0.46	12 – 18	14, 16	Glabrous
McClellan & Bayer 240 (GRA, NU, PRE)	Mont Aux Sources 2828DD	3200	Deeply lobed 0.54	12	12	Glabrous
Steyn 1043 (NBG, PRE)	Sentinel 2828DD		Distinctly lobed	c. 13	12, 13	Glabrous
Wright 488 (NU)	Bushman's River Pass 2829DD	3170	Shallowly lobed	12	12, 13	Ciliate + hairy
Phillipson 1375 (MO)	Molimu-Nthuse Pass 2927BD	2250	Fairly distinctly lobed 0.29	8	c. 12	Sparsely ciliate + sparsely hairy
Hilliard & Burt 9811 (NU)	Sani Pass 2929CB	2380	Fairly distinctly lobed 0.3	8	13	Almost glabrous (sparsely ciliate + few hairs on top)
Hilliard & Burt 9664 (K, NU, MO)	Sani Top 2929CB	2865	Shallow 0.19	12, 13	13	NU: glabrous faces, sparsely ciliate at tops; K: sparsely hairy; MO: glabrous

Table 2 (contd.)

<i>Schwabe</i> M006 (NU)	Sani Top 2929CB	2900	Shallow 0.26	10	12, 13	Ciliate + sparsely hairy
<i>Jacot-Guillarmod</i> 2081 (PRE)	Motiti R. 2828DC	3110	Shallow 0.22	12	12, 13	Glabrous
<i>Ruch</i> 2487 (PRE)	Maseru Distr. 2927AC	1890	Shallow 0.20	c. 8	c. 12	Glabrous
<i>Phillipson</i> 1366 (MO, PRE)	Blue Mt Pass 2928BD	2700	Very shallow 0.13	8	c. 12	Glabrous
<i>Schmitz</i> 8227 (NU)	Blue Mt Pass 2928BD	2500	Distinctly lobed (+ pinnae) 0.38	9 – 12	12, 13	Glabrous
<i>Ruch</i> 2482 (PRE)	Pass between Sani & Sehongberg 2929AC		Shallow	11	c. 12	Glabrous
<i>Ruch</i> 2456 (PRE)	Mokhotlong 2929AC	2745	Fairly shallowly lobed, toothed	12	12, 13	Ciliate + hairy
<i>Hilliard</i> 5300 (NU)	Sani Pass 2929CB	2745	Shallow (but sharply toothed)	8 – 12	12, 13	Ciliate + hairy
<i>Grice</i> s.n. (NU 56 207)	Sani Pass 2929CB		Shallow (but quite sharply toothed)	13	12 – 16	Ciliate + hairy
<i>Hilliard & Burt</i> 15364 (NU)	Mahlangubo R. headwater 2929CB	2590	Distinctly lobed 0.45	9 – 12	c. 12	Ciliate + sparsely hairy
<i>Hilliard & Burt</i> 15208 (NU)	Mahlangubo R. headwater 2929CB	2530	Distinctly lobed 0.33	10 – 12	12, 13	Sparsely ciliate + sparsely hairy
<i>Bayliss</i> BRI 1303 (GRA, MO, PRE, WAG, Z)	Sehlabathebe Reserve, Lesotho 2929CC		Distinctly lobed 0.32	8, 9, 11	12, 13	Almost glabrous; GRA: sparsely ciliate + sparsely hairy
<i>Trauseld</i> 380 (NU)	Giants Castle 2929CC	2745	Fairly deeply lobed, sharp teeth 0.48	8, 10, 12	12	Sparsely ciliate + glabrous faces/ glabrous margins + sparsely hairy
<i>Hilliard & Burt</i> 8921 (K, MO, NU, PRE, S)	Bushman's Nek, Thamathu Pass 2929CC	2440	Very distinctly lobed, sharply toothed	8	c. 12	Glabrous/sparsely hairy
<i>Hoener</i> 1450c (NU, PRE)	Sehlabathebe National Park, Lesotho 2929CC	2390	Distinctly lobed	8; 9	11, 12	Ciliate + sparsely hairy
<i>Galpin</i> 6710 (BOL, K, PRE)	Doodman's Krans 3027DC	2775	Distinctly lobed 0.39	10	c. 12	Ciliate + very sparsely hairy/glabrous faces

the Hogsback and Katberg mountain ranges and possibly in the Zuurberg. Plants previously identified as *C. britteniae* have very large and conspicuous auricles, 5 or 6 rays and mainly glabrous cypselae, but a very few hairs occur on the margins of cypselae of some specimens [*Galpin* 2440 (GRA) and *Schonland* 4441 (GRA)].

The specimens from the Zuurberg also exhibit variation in the indumentum of the cypselae (ciliate and hairy vs. glabrous) and have slightly cobwebby/hairy peduncles, and leaf shape ranging from deltoid to reniform. They were possibly previously identified as *Cineraria lobata* as only this species is listed in the checklist of Zuurberg (Van Wyk *et al.* 1988).

Cineraria polycephala, known only from the type collection from near the river banks of the Gouritzrivier and at Visbaai in the Western Cape, is most likely also synonymous with the very variable *C. erodioides*. It has the auricles and trichomes characteristic of *C. erodioides*, but its capitula are more compact than usual for *C. erodioides* and its cypselae are only margined (not narrow winged). However, some plants previously identified as *C. dieterlenii* also have cypselae that are margined not distinctly winged. The specimen named *C. polycephala* is also similar to the many-headed form of *C. lobata* subsp. *lobata* (Fig. 15A), which also occurs in the southern coastal region of the Western Cape, but the leaves of *C. polycephala* are more deltoid than reniform and are cobwebby (vs. sparsely hairy or hairy) and the involucre bracts are also cobwebby, whereas they are glabrous (or occasionally sparsely hairy) in this form of *C. lobata*.

Harvey (1865) matched the Ecklon & Zeyher type specimens of *Cineraria erodioides* to a specimen in Thunberg's herbarium, marked *C. tussilaginis* (Thunberg's handwriting), and to Thunberg's descriptions (1800, 1823). Harvey did not restore the name 'tussilaginea' lest it be confused with *C. tussilaginis* L'Hér. (now *Pericallis tussilaginis* (L'Hér.) D. Don). A formal request for a decision regarding homonymy has been submitted to the General Committee, and failing that, a formal proposal for rejection of the name *C. tussilaginea* Thunb. will be submitted.

Cineraria tussilaginea has been listed as a synonym (in part) for *C. erodioides* in checklists of South African plants (Arnold & De Wet 1993: 759; Herman 2003: 202) and in part for *Senecio verbascifolius* Burm. f. (DC. 1838: 389; Harvey 1865: 381; Arnold & De Wet 1993: 768; Welman 2003: 293). We have examined the Sieber n.33 specimen cited by de Candolle (Prodr. 6: 389 (1838); microfiche 1125: 15 in the de Candolle collection) and conclude that de Candolle (l.c.) incorrectly placed *C. tussilaginea* in synonymy with *S. verbascifolius* because of a label originally misidentifying the Sieber specimen n.33 (dated 1825) as *C. tussilaginea*. It has subsequently been identified as *C. hypoleuca* Rchb. and then as *S. verbascifolius* — the last presumably by de Candolle himself. It would appear that neither Sieber nor de Candolle saw the original Thunberg specimen on which his description of *C. tussilaginea* was based. This mistaken synonymy has been carried forward in subsequent publications.

Key to varieties of *Cineraria erodioides*

Leaves sparsely hairy or thinly cobwebby, sometimes glabrescent below var. **erodioides**
 Leaves tomentose white or grey below var. **tomentosa**

Cineraria erodioides DC. var. **erodioides**

Perennial suffrutex, to c. 1 m tall. *Stems* cobwebby to softly hairy, glabrescent. *Leaves* reniform to deltoid-reniform in outline, shallowly or deeply lobed, lamina 10 × 47 – 10 × 71 mm, thinly cobwebby to glabrescent or sparsely hairy or glabrous above, thickly cobwebby (then canescent) or sparsely hairy or hairy below, glabrescent, young leaves often white-woolly; petiole 5 – 65(–95) mm long, cobwebby or sparsely hairy to hairy; auricles usually very conspicuous, auriform, dentate and characteristically procurvent (running up petiole) to varying degrees. *Capitula* few (4 – 12) to many (20

– 95) per stem branch in a lax corymbose panicle; peduncles 5 – 27 mm long, cobwebby, somewhat glabrescent, or sparsely hairy to occasionally glabrous, bracteate. *Involucre bracts* 8 – 13, (3 –)4 – 5 mm long, glabrous or cobwebby when young, glabrescent, usually remaining cobwebby only at base amongst calyculus bracts. *Ray florets* 5 – 8(–13), 5.5 – 9.0 mm long; limb 3.0 – 6.5 mm long, 4(–5)-veined. *Disc florets* (20 –)25 – 40(–80); corolla (3.0 –)3.5 – 5.0 mm long. *Cypselae* with a distinct, pale wing (narrow to broad), or distinctly margined, (2.0 –)2.5 – 2.8 mm long, ciliate with sparsely hairy or glabrous faces or entirely glabrous (occasionally with a few hairs on 'shoulders').

SELECTED COLLECTIONS. LESOTHO: Mount Lei-kopo, Likhale, April 1916, *Dieterlen* 1238 & 1239 (P, PRE); Mamathes, 15 April 1949, *Jacot-Guillarmod* 826 (PRE); Ha Nkoti, *Schmitz* 7480 (PRE); Mount Ha-moya-pela Likhale, April 1916, *Dieterlen* 1237 (NBG, PRE); Sani Pass, 9 Jan. 1975, *Hilliard & Burt* 9664 (K, MO, NU); Sehlabathebe National Park, 29 Jan. 1975, *Bayliss* BS.1303 (GRA, MO, PRE, WAG, Z); Plateau near summit of Bushmans R. Pass, 19 March 1968, *Wright* 488 (NU); Hlotse (Leribe), March 1915, *Dieterlen* 576 (BM, NBG, NH, P, PRE, Z); Maboloka Mountain, Hlotse (Leribe), 6 March 1915, *Dieterlen* 576b (PRE); Motete R., 5 Feb. 1954, *Jacot-Guillarmod* 2081 (PRE); Mahlasela Pass, near Oxbow, 19 March 1986, *Phillipson* 1405 (K, MO, PRE, UPS); Maseru Distr., 8 May 1962, *Ruch* 2487 (PRE); Morija, June 1914, *Jacottet* 12 (Z); Molimu Nthuse Pass, 27 March 1986, *Phillipson* 1375 (UPS); Blue Mt Pass, 27 March 1986, *Phillipson* 1366 (MO, PRE). **SOUTH AFRICA:** Limpopo Province: Wolkberg Wilderness Area, Serala Buttress, 14 March 1991, *Van Wyk & Matthews* 10530 (PRU); Woodbush, 28 Dec. 1943, *Mogg* s.n. sub PRE 44071; North-West Province: Magaliesberg, 28 Aug. 1980, *Macnae* s.n. sub J32719 (J, PRE); Magaliesberg, Nootgedacht, 20 April 1940, *Van Rensburg* s.n. sub J36973; Potchefstroom Distr., *Brantmuller* s.n. sub PRE 44149 (PRE); Gauteng: about 9 miles W of Krugersdorp on Farm Gladysvale, 25 Feb. 1948, *Rodin* 3894 (K, PRE, US); Rustenburg, Uitkomst 299 JQ, *Coetzee* 290 (PRE); Fairy Glen, Pretoria, 29 March 1908, *Leendertz* 1116 (BOL); Mpumalanga: Mariepskop, Jan., *Werdermann & Oberdieck* 1859 (K, PRE, US, WAG); Blyde R. Canyon Nature Reserve, 5 April 1981, *Smith* 242 (J); Mount Sheba Nature Reserve, 30 April 1980, *Balkwill* MS1.60 (J); Ohrigstad Nature Reserve, 20 April 1976, *Theron* 3605 (PRE, PRU); Wonder Point near God's Window, 10 km N of Graskop, 21 April 1994, *Cron* 279 (J, K, PRE, MO); Kaapse Hoop, Barberton Division, *Rogers* 21273 (K); Farm Oshoek, Wakkerstroom Distr., 14 April 1961, *Devenish* 647 (K, PRE); Free State: Mont Aux Sources, the Sentinel, 14 April 1951, *Steyn* 1043 (NBG, PRE); Mont Aux Sources, March 1898, *Evans* 1357 (NH, K, PRE); Harrismith, Feb. 1905, *Sankey* 92 (K); Kroonstad Distr., Ironstone Koppie, Feb. 1928, *Pont* 312 (Z); Steynsrus, *Fuls* 69 (PRE, PRU); Warden Distr., Farm Elizabeth, 20 km E of Warden, 20 Feb. 1992, *Eckhardt* 230 (PRU); Senekal Distr., Willem Pretorius Wildtuin, Doringsberg, 14 April 1976, *Müller* 1899 (PRE); Fauresmith, Oorlogspoort, 1 May 1934, *Verdoorn* 1355 (K, PRE); Naval Hill, Bloemfontein, Sept. 1917, *Moss* 2597 (BOL, Z); Dewetsdorp, 15 April 1950, *Steyn* 928 (NBG); Philippolis, below Spioenkop Nek, 8 Sept. 1927, *Smith* 4469 (PRE); KwaZulu-Natal: Utrecht, Naauwhoek, 16 April 1961, *Devenish* 651 (BM, NH, NU, WAG); Plaas Nolens Volens, E of Van Reenen, 16 March 1974, *Jacobsz* 1508 (K, PRE);

Kranskop, Ntunjambili, *Hilliard* 1446 (NU); Bergville Distr., Hlolela, the Cavern, *L'ange* 101 (NU); Farm Rensburgkop near Swinburne, *Jacobsz* 452 (NBG); Van Reenen, 22 Jan. 1908, *Medley Wood* 10718 (GRA, NH); Cathedral Peak Forest Reserve Station, 20 Feb. 1951, *Killick* 1426 (K, NH); Giants Castle Reserve, 19 May 1963, *Hilliard* 1512 (NH); Kamberg, Gladstone's Nose, 2 May 1989, *Cron, Scott-Shaw & Ching* 1 (J, K, MO); Mphendle, Mulangane Ridge, above Carter's Neck, 15 March 1985, *Hilliard & Burt* 18395 (NU, K, PRE, S); Lion's R. Distr., Farm Allendale, 8 Jan. 1976, *Hilliard & Burt* 8743 (NU, S); Qacha's Nek Distr., Sani Pass lodge, *Hedberg* 82102 (UPS); Bamboo Mt, 9 April 1977, *Hilliard & Burt* 10091 (MO, NU, S); Cobham Forest Reserve, Sipongweni caves, 13 April 1974, *Hilliard & Burt* 5517 (NU, S); Bushman's Nek, Thamathu Pass, 4 Feb. 1976, *Hilliard & Burt* 8921 (K, MO, NU, PRE, S); Underberg, Garden Castle, 3 Feb. 1975, *Hilliard & Burt* 7939 (K, MO, NU); Mahwaqa Mt, 3 Jan. 1975, *Hilliard & Burt* 7591 (NU); Polela, Feb. 1896, *Evans* 716 (NH); Mpendhle Pass, *Mogg* 34838 (K); Nottingham Rd, March 1939, *McClellan* 886 (K, NH); Ntsikeni Nature Reserve, Mangeni Mountain, 20 March 1999, *Abbott* 7587 (PRU); Mt Currie near Kokstad, April 1883, *Tyson* 1147 (BOL, K, NH, PRE, SAM); Eastern Cape: Eland's Hoek, near Aliwal North, *Bolus* 17 (BOL); Klipfontein, near Aliwal North, *Hutchinson* 16978 (BM); Sterkspruit, Herschel Distr., May 1917, *Hepburn* 369 (GRA, PRE); near Kokstad, Mt Currie, *Tyson* 1483 (BOL, PRE); Weza, Zuurburg, 3 March 1974, *Hilliard* 5457 (K, MO, NBG, NU, S); Alfred Distr., Zuurburg, 24 April 1977, *Hilliard & Burt* 10177 (MO, NU, S); Weza, Ngele Forest, 24 Feb. 1990, *Abbott* 5251 (NH, PRU); Ngele, below Eagle's Nest, 23 April 1990, *Abbott* 5281 (PRU); Albert Division, near Burghersdorp, Dec. 1892, *Flanagan* 1545 (PRE, SAM, WAG); Witteberg, Joubert's Pass, *Hilliard & Burt* 12227 (K, NU); Barkly East Distr., Summit Doodman's Krans, 9 March 1904, *Galpin* 6713 (K, PRE); Naudé's Nek, 3 April 1999, *Cron & Goodman* 554 (E, J, K, MO); *ibidem*, 13 Feb. 1983, *Hilliard & Burt* 16603 (K, NU, PRE, S); Ben McDhui, 4 Feb. 1983, *Hilliard & Burt* 16434 (NU); Suurburg, Steynsburg Distr., April 1944, *Thorns* s.n. sub NBG 29273; Buffelsfontein, Wodehouse Distr., *Hutchinson* 16799 (BM); Queenstown, May, *Galpin* 1529 (K); Elliott Distr., Fetcani Pass, *Hilliard & Burt* 12343 (NU); Graaff-Reinet, Karoo Nature Reserve, *Linger* 2065 (PRE); Tarka Distr., Fairfield, Great Winterberg, 24 March 1954, *Acocks* 17641 (K, PRE, UPS); near Shiloh, Queenstown, Feb. 188?, *Bauer* 785 (K, SAM); on road to Cathcart, near Klipplaat R. bridge, 4 April 1985, *Phillipson* 1092 (MO, PRE, UPS); Valley N of Elandsberg, 6 April 1984, *Phillipson* 814 (K, MO); Katberg, Feb. 188?, *Baur* 1067 (K); Katberg Pass, Jan. 1979, *Hilliard & Burt* 12361 (K, NU, S); Seymour, Menziesberg, *Phillipson & Hutchings* 115 (K, MO,

PRE); Cathcart, Rockford Bridge, 14 April 1955, Johnson 1191 (PRE, UPS); Fort Cunningham, May 1898, Galpin 2440 (GRA, PRE); Keiskama, Cata Forest Reserve, Story 3316 (PRE); Gubu dam, 14 Dec. 1977, Hilliard & Burt 11059 (K, MO, NU, S); Hogsback, forest reserve above Kettleispout Falls, Dec. 1977, Hilliard & Burt 10933 (K, MO, NU, PRE); Hobbiton, 5 April 1999, Cron & Goodman 561 (B, C, E, J); Uitenhage Distr., Bethalsdorp, 28 Sept. 1930, Long 16 (GRA, K); Baakens R., Fern Glen, Oct. 1974, Olivier 1216 (NBG); Salem, Kariëga R., 30 Nov. 1922, Britten 2954 (GRA); Faraway, portion 3 of Coldsprings, 16 April 1984, Jacot-Guillarmod 9504 (GRA, MO, PRE); Grahamstown Nature Reserve, 2 Dec. 1977, Hilliard & Burt 10820 (MO, NU, PRE, S); Bathurst, Kenton-on-Sea, Acocks 18322 (PRE); Kowie West, Britten 2838 (GRA). Western Cape: Botterliersfontein, Albertinia, Muir 1636 (BOL, PRE); Visbaai, near Mossel Bay, Aug. 1831, Drège 5903 (holotype of *C. polycephala* G-DC, isotypes P, K, S).

Cineraria cf. *erodioides* (with long peduncles, few capitula): Eastern Cape: Conway Farm, Aug. 1899, Gilfillen sub Galpin 5544 (GRA, PRE); Intaba Maqwele Mts, Queenstown, April 1896, Galpin 2127 (GRA, PRE); Somerset East Distr., Mts S of Cradock, 14 April 1981, Phillipson 291 (K, PRE); Mountain Zebra National Park, Bankberg, 22 Nov. 1977, Hilliard & Burt 10573 (NU); Mountain Zebra National Park, Muller 543 (PRE); near Mortimer, Cradock Distr., Jan. 1901, Kensit s.n. sub BOL 9279 (BOL, MO); Western Cape: Oudtshoorn, Cango, 19 April 1941, Compton 10740 (NBG).

***Cineraria erodioides* DC. var. *tomentosa* Cron var. nov.** a var. *erodioides* caulis et foliis tomentosus albis vel canis, auriculatis majoribus plerumque foliis conflatis differt. Typus: South Africa: Limpopo Province, Venda, Gogogo, 1 July 2000, Cron & Goodman 574 (holotypus J!, isotypi E!, K!, MO!, PRE!, S!).

Perennial herb, to c. 0.5 m high. *Stems* white velvety, slightly glabrescent. *Leaves* reniform, shallowly 5–7-lobed, green or grey-canescens above, tomentose white or grey below, occasionally glabrescent; lamina 14–40(–70) × 20–55(–90) mm; petioles tomentose, 14–30 mm long, with very prominent procurrent auricles, frequently joining lamina in uppermost leaves. *Capitula* few (c. 4 per stem branch) in a lax corymbose panicle; peduncles thickly cobwebby, 5–40 mm long, very sparsely bracteate, bracts 3–4 mm long. *Involucral bracts* cobwebby, slightly glabrescent, calyculate, 12(–13), 5–6 mm long. *Rays* 5–8, 7–7.5 mm long; limb 4–6 mm long (× 1.6–2.5 mm), 4-veined. *Disc florets* c. 34; corolla 4.5–5.0 mm long. *Cypselae* margined, ciliate and sparsely hairy to hairy, brown, c. 3 mm long. Fig. 10B.

PHENOLOGY. Flowering in May to July and in October.

COLLECTIONS EXAMINED. SOUTH AFRICA: Limpopo Province, Venda, Gogogo, 6 Oct. 1981, Van Wyk & Theron 4688 (PRE, PRU); *ibidem*, 1 July 2000, Cron & Goodman 574 (E, J, K, MO, PRE, S); *ibidem*, 1 July 2000, Cron & Goodman 575 (J, K); near Gogogo, 1 July 2000, Cron & Goodman 578 (BM, CM, J); *ibidem*, 1 July 2000, Cron & Goodman 579 (B, J, LISC).

NOTES. *Cineraria erodioides* var. *tomentosa* is known only from the type locality near Gogogo in Venda, Limpopo Province, where it occurs near the crest of a mountain on the southern or south-eastern aspect, amongst rocks and shrubs and at an altitude between 1100 and 1250 m. This is a very inaccessible area, and there may well be other populations in surrounding areas. *C. erodioides* var. *tomentosa* is very similar to *C. erodioides* var. *erodioides* in that it has the characteristic auricles of that species and its leaves are reniform and shallowly lobed, but are very grey-canescens above and strikingly white-tomentose below. The trichomes are very fine, giving the stems and leaves a velvety finish, similar to some specimens of *C. canescens*. Its auricles are extremely large and prominent, often extending up the petiole so far as to meet with the lamina of the leaf (Fig. 11B). **CONSERVATION STATUS.** Because of its extremely small known area of occurrence, *Cineraria erodioides* var. *tomentosa* is considered to be Orange List, Rare.

17. *Cineraria glandulosa* Cron in Cron *et al.* (2006a: 37–38). Type: South Africa, KwaZulu-Natal, Mphendle Distr., Farm Tillietudlem, c. 1525 m [5000'], 6 April 1957, Huntley 154 (holotype NH!, isotype NU!).

Perennial (?) herb, to about 0.5 m tall. *Stems* woody and branching towards base, green with reddish-brown lines, or brown, hairy. *Leaves* deltoid-reniform to reniform, occasionally with one or two lateral pinnae; lamina 10–24 × 12–26 mm, green, densely covered with pilose glandular hairs on both surfaces and on margins; apex obtuse; margin dentate; base subcordate to cordate; petiole 6–32 mm long, densely covered with glandular hairs; auricles conspicuous and procurrent, or rarely absent. *Capitula* heterogamous, radiate, few (2–10) to many (8–24), rarely as many as 46 per stem, in a lax panicle; peduncles 7–35 mm long, glabrous to sparsely hairy, glabrescent or densely hairy, bracteate, bracts 2.0–3.5 mm long. *Involucre* calyculate, calyculus bracts with glandular hairs; phyllaries 8–10, 4.0–5.0 (–7.0) mm long, glabrous or hairy; margins scarious. *Ray florets* 5, rarely 7, 6.0–8.5 mm long; limb 3.0–6.0 mm long, 4-veined. *Disc florets* 18–24; corolla c. 4.0 mm long. *Cypselae* obovate, compressed sometimes with strong median midrib when mature, margined, brown, 2.0–3.0 mm long, glabrous. *Pappus* to base of disc corolla lobes (c. 3.5 mm long). Fig. 7H.

PHENOLOGY. Flowering in March and April.

DISTRIBUTION. South Africa, KwaZulu-Natal, in the Mphendle, Umlazi and New Hanover Distrs, as well as near Murchison (Map 3).

SELECTED COLLECTIONS. SOUTH AFRICA: KwaZulu-Natal: Loteni Nature Reserve, 7 April 1979, *Phelan* 366 (NU); Mpendhle, New Hanover Distr., Little Noodsberg, Laager Farm, 24 April 1981, *Hilliard & Burt* 14512 (K, NU); Hills above Illovo R., April 1883/4, *Medley Wood* 1898 (BOL, K, NH); Murchison, May 1884, *Medley Wood* 3074 (NH).

Putative hybrids between *C. glandulosa* and *C. atriplicifolia*: SOUTH AFRICA: KwaZulu-Natal: Richmond, Tala Farm, 7 March 1966, *Moll* 3037 (NH, NU); Richmond Distr., Farm Wingfield, 1 June 1989, *Cron & Scott-Shaw* 9 (J, K, MO).

HABITAT. Amongst grass and rocks on slopes of river valleys, or at base of cliffs above river gorges; (630 –) 1400 – 1800 m.

CONSERVATION STATUS. A rare and potentially vulnerable species, restricted in distribution with small populations. Collected twice from Loteni Nature Reserve where it is protected. It has been classified as Orange List, Rare, as its habitat is not very prone to destruction by humans.

NOTES. *Cineraria glandulosa* resembles *C. erodioides* in its reniform leaf shape and procurrent auricles, but differs in the dense coverage of glandular hairs on the leaves and stem, and sometimes on the involucral bracts (always on the calyculus bracts) and the generally smaller capitula (five ray florets and 18 – 24 disc florets).

Hilliard (1977: 379 – 380) recognised this entity as a potentially distinct species (no. 6), but in her description included *Moll* 3037 (K, NU) from the Richmond Distr., matched by *Cron & Scott-Shaw* 9 (J, K, MO) from the same district. However, while these specimens certainly have the glandular tomentum, their leaves closely resemble those of *Cineraria atriplicifolia* in their deltoid shape and dissection, and their auricles are sharply toothed and dissected, not procurrent. They have many more capitula on shorter peduncles and their growth form also more closely resembles *C. atriplicifolia* than *C. glandulosa*. These specimens are the result of reticulate evolution involving a hybridisation event between *C. glandulosa* and *C. atriplicifolia*. (The manuscript name of '*C. collina*' Hutch & Taylor ined. is indicated on the *Medley Wood* 1898 (NH, K) specimens, but the name has no validity.)

18. *Cineraria vallis-pacis* Dinter ex Merxm. (1960: 605); Merxmüller (1967: 42). Type: Namibia, Distr. Rehoboth: Friedental, Nordbastardland, 1 Jan. 1935, *Dinter* 7989 (holotype M; isotypes BM!, 2 shts. BOL!, K!, 2 shts. PRE!).

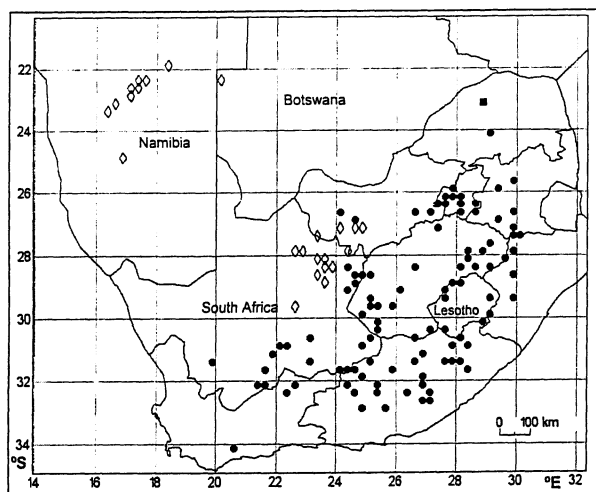
Cineraria vallis-pacis Range (1938: 268) (nomen nudum).

Perennial suffrutex, commonly 0.3 – 0.7 m tall, bushes reaching as tall as 2 m. *Stems* woody towards the base with diameter 3 – 7 mm, branching, cobwebby, glabrescent, distinctly lined. *Leaves* deltoid-reniform to ovate in outline, shallowly or distinctly 5 – 7 lobed with 1, 2 or 3 pairs of subopposite lateral pinnae, uppermost leaves often pinnatifid (to lyrate-pinnatifid), sometimes decurrent; lamina 13 – 52 × 15 – 55(–75) mm, total leaf length 21 – 85 × 16 – 100 mm, young leaves densely tomentose, glabrescent to cobwebby above and below; apex obtuse to rounded; margin coarsely or minutely dentate; base truncate to subcordate, to cordate in lower leaves; petiole 4 – 15 mm long excluding pinnate section, 8 – 70 mm long including pinnate section, cobwebby, glabrescent; auricles large and conspicuous, auriform, dentate. *Capitula* heterogamous, radiate, many (14 – 140 per branch) in subcorymbose panicles; peduncles 2 – 12 mm long, cobwebby, glabrescent, bracteate, basal bract subtending peduncle c. 22 mm long. *Involucre* calyculate; phyllaries 8 – 10(–12), 3.5 – 4.5 mm long, often glabrous, cobwebby at base amongst calyculus bracts, or occasionally thickly cobwebby; margins scarious. *Ray florets* 5 – 8, 5 – 7 mm long; limb 3 – 5 mm, 4-veined. *Disc florets* c. 25 – 30; corolla 3.5 – 4.2 mm long. *Cypselae* obovate, compressed, ray cypselae broad-winged (wings c. 0.5 mm wide), disc cypselae broad-winged or narrow-winged, dark brown with paler brown wings, 2.0 – 2.8 mm long, usually densely ciliate on wing, glabrous on inner face, sparsely hairy on central rib of outer face. *Pappus* c. 4.5 mm long. Fig. 7J.

PHENOLOGY. Flowering mainly from December to April, with occasional collections in October, June and July.

DISTRIBUTION. Namibia, predominantly in the mountainous regions in the Windhoek, Rehoboth and Maltahöhe Distrs; Botswana: a single collection known from Okwa Valley, near the Namibian border; South Africa, in the Northern Cape (Map 10).

SELECTED COLLECTIONS. BOTSWANA: Okwa valley, 1 km NE of Namibian border, 2 July 1978, *Skarpe* S-290 (K, PRE, UPS). NAMIBIA: Gobabis Distr., Steinhausen vicinity, Farm Lausitz 220, about 45 miles N of Witvlei, *Kers* 1041 (S); Regieringsfarm, Neudamm, 18 Jan. 1958, *Merxmüller & Giess* 1263 (PRE); Kappsfarm, 14 Jan. 1958, *Merxmüller & Giess* 1244 (PRE); Farm Badenhausen, 23 March 1961, *Seydel* 2688 (K, S, US, WAG); Avis Dam, 5 km E of Windhoek, 6 March 1968, *Wanntorp* 58 (S); Farm Voigtskirch 135, Windhoek-Steinhausen road, c. 50 km ENE of Windhoek, 6 April 1968, *Wanntorp* 701 (K, S); Windhoek, Farm Finkenstein, 6 April 1966, *Seydel*



Map 10. Known distribution of *Cineraria aspera* (●), *C. cyanomontana* (■) and *C. vallis-pacis* (◇).

4403 (K, PRE, WAG); Windhoek, Bergland, 5 June 1963, Seydel 3533 (K, US); Finkenstein, des Hausriviers, 19 Oct. 1963, Seydel 3689 (K, US); Rehoboth, Farm Hohenheim, Walter 1712 (PRE); Farm Friedental, 6 March 1977, Giess 14840 (PRE); Friedental, Nordbastardland, 1 Jan. 1935, Dinter 7989 (isotypes BM, BOL, K, PRE); Maltahohe, Dinter 8008 (PRE). SOUTH AFRICA: Northern Cape: 5.5 km from N14 near Olifantshoek, 8 April 2000, Balkwill & McDade 11805 (J); Postmasburg, Toto Mt, 12 miles NNW of Olifantshoek, 27 Aug. 1961, Leistner & Joynt 2737 (K, PRE); Kuruman, 23 March 1939, Esterhuysen 901 (BOL); Batlharos, Silk 81 (PRE); Vryburg Distr., Farm Zoet Vley, 6 March 1989, Speedy 302 (PRE); between Zwartfontein and Geluk, 5 May 1912, Burttt Davy 14048 (K); Vryburg Distr., Tigerkloof, April 1945, Brueckner 308 (BOL, PRE); Barkly West, Boetsap, Kimberley, Sept. 1925, Wilman s.n. sub KMG 2597 (K, SAM 51167); Daniëlskuil, March 1913, Lawson s.n. (BOL); Klein Papkuil, Griqualand West, Feb. 1921, Wilman 16929 (BOL); Griqualand West, Wolwefontein, 3 Nov. 1936, Acocks H1231 (PRE); Asbestos Mts, July 1894, Marloth 2015 (PRE); Campbell, Griqualand West, March 1921, Wilman 1437 (BOL, PRE); Prieska, April 1932, Bryant 889 (GRA, K).

HABITAT. Growing luxuriantly on the banks of rivers (e.g. Avis, Weissen Nossob) in Namibia. In the Northern Cape, commonly found on well-drained red-brown sandy soil (Kalahari sands), on gentle, north-facing slopes, often abundant at the base of the slope, which may be stony; also growing in shady areas, sprawling beneath bushes, and in deep sandy soil on the banks of the Orange River. In Botswana, growing on fine dark soil under trees on valley slopes; 1400–2000 m in Namibia; 1140–1525 m in the Northern Cape.

CONSERVATION STATUS. Least Concern. A fairly widespread species that is common and abundant in certain areas.

NOTES. *Cineraria vallis-pacis* is usually easily identified by the shape and pinnatifid nature of its leaves and its broadly-winged ciliate ray cypselae. In Namibia, the disc cypselae also tend to be broad-winged, but in the Northern Cape (South Africa), they are only narrow-winged. The inner face of the cypselae is glabrous, the outer usually sparsely hairy, mainly along the central rib.

Skarpe S-290 (K, PRE, UPS) from Botswana has shallowly-lobed leaves which are not pinnatifid, and are minutely auricled, but otherwise matches *Cineraria vallis-pacis* well. The lower leaves are described as 'often purple'. Some of the Northern Cape specimens have thickly cobwebby involucre bracts, not seen in the Namibian specimens. Their young leaves are grey due to a fairly dense cobwebby tomentum, but older leaves are dark green above, greyish-green below. It is noted that in the Northern Cape, the bushes are lightly browsed by cattle, which only graze it halfway down the stem.

Cineraria vallis-pacis could be confused with *C. alchemilloides* subsp. *namibiensis* in Namibia, but the cypselae of the latter species are not broad-winged (only margined) and their leaves are more deltoid to deltoid-reniform, with fewer teeth along the margin and only rarely have pinnae on the uppermost leaves.

19. *Cineraria aspera* Thunb. (1800: 153); Willd. (1803: 2086); Thunb. (1823: 672); Spreng. (1826: 550); DC. (1838: 306); Harv. (1865: 309); Hilliard (1977: 376). Type: South Africa, Cape of Good Hope, Thunberg 19896 (holotype UPS-THUNB!).

Cineraria burkei Burttt Davy & Hutch. (1936: 80–81); **synon. nov.** Type: South Africa, Potchefstroom Distr., near Schoonspruit, *Burke* s.n. (holotype K!).

Cineraria hamiltoni S. Moore (1902b: 382); **synon. nov.** Type: South Africa, Free State, near Vredefort Road, Oct. 1902, *Captain Barrett-Hamilton* s.n. (holotype K!).

Perennial spreading shrublet, to 1 m tall and as wide. Stems woody, branching mainly near the base but also to some extent along their length, green to reddish-brown usually with greyish or whitish tone due to hairs, lined. Leaves pinnatisect with ovate to elliptic outline, lobes dentate and usually pinnatilobed, often with one or two lateral pinnae below main region of lamina; lamina (10–)18–84 × 12–77 mm, lobes 0.7–9.0 mm wide at the narrowest point on lobe, greyish-green due to thick cobwebby indumentum on upper and lower surfaces, although often glabrescing more on the upper surface, buds and young leaves white-woolly; apex acute; margin dentate; base

truncate to subcordate (to cordate); petiole 5 – 50 mm long, thickly to thinly cobwebby; auricles present, varying from small to very conspicuous, auriform, but often dissected into lobes. *Capitula* heterogamous, radiate, usually many (18 – 106) per stem branch arranged in compact corymbose panicle, occasionally fewer (8 – 12 per stem branch); peduncles 3 – 19 mm long, cobwebby, usually conspicuously bracteate with linear to lanceolate bracts, 2 – 4(– 8) mm long. *Involucre* calyculate; phyllaries 8 – 10(– 13), 4 – 5 mm long, glabrous though cobwebby amongst calyculus bracts; margins scarious. *Ray florets* 5 – 8, 5.0 – 8 .0 mm long; limb 3.0 – 6.0 mm long, 4-veined. *Disc florets* 14 – 28; corolla 3.8 – 5.0 mm long. *Cypselae* obovate, compressed, margined, dark brown when mature, 2.0 – 2.6 mm long, ciliate and hairy, occasionally sparsely hairy on faces. *Pappus* as long as disc floret corolla or nearly so. Figs 10C, D, 11A.

PHENOLOGY. Flowering mainly February to June, occasionally as early as January or as late as July or August. A few collections, mainly in the Western Cape, flowering in October, November and December.

DISTRIBUTION. Widespread in South Africa: from near Fraserburg in the Northern Cape, the Beaufort West area in the Western Cape, across the mountains to Graaff-Reinet, Cradock and the Cathcart regions in the Eastern Cape; to the Free State and southern Mpumalanga, and the hills (koppies) south of Johannesburg in Gauteng and the region near Potchefstroom in North-West. Also known from the Hlotse (Leribe) Plateau, Sehlabathebe National Park and the Teyateyaneng District in Lesotho (Map 10).

SELECTED COLLECTIONS. LESOTHO: Hlotse (Leribe), *Dieterlen* 7144 (SAM); Hlotse (Leribe), *Dieterlen* 125 (NH, P); Teyateyaneng Distr., April 1938, *Collett* 484 (K, PRE); Roma, 19 April 1978, *Schmitz* 8212 (NU); Sehlabathebe National Park, 29 April 1977, *Hoener* 1826 (NU); Quthing, 11 May 1973, *Phillips* s.n. sub NU 58059 (NU). SOUTH AFRICA: North-West Province: Marico, Sephtons Nek, 3 miles N of Zeerust, 28 June 1956, *Leistner* 666 (K, PRE); near Bretley mine, N of Vryburg, 22 May 1954, *Acocks* 17678 (BOL, K); Ironstone Koppie at Nootgedacht, 11 June 1936, *Acocks* 422 (PRE); Potchefstroom Distr., near Schoonspruit, *Burke* s.n. (holotype for *C. burkei*, K); Scheerpoort, Magaliesberg, 4 March 1958, *Van Vuuren* 500 (PRE); near Schoonspruit, *Burke* 193 (K); Krugersdorp, Sterkfontein Caves, Swartkrans 67, 14 March 1970, *Mogg* 35408 (J); Waterval 74, 2 miles WNW of Krugersdorp, 4 April 1954, *Mogg & Lighton* 23294 (J); Gauteng: Marais Kloof, Northcliff Ridge, 24 June 1950, *Mogg, Cunliff & Reid* 19780 (J); Moffat Park, 28 March 1994, *Cron & Balkwill* 256 (B, E, J, K, PRE); Bez Valley, *Rand* 887 (BM); Heidelberg Distr., Suikerbosrand Nature Reserve, 6 April 1972,

Bredenkamp 796 (PRE, PRU); Mpumalanga: Middelburg, Doornberghoek, 10 May 1938, *Acocks* 8663 (PRE); Standerton, Nov. 1916, *Rogers* 18766 (J); Wakkerstroom, 'Oshoek' farm, 14 May 1978, *Devenish* 1927 (K, NU); Free State: Reitz, 1 April 1992, *Fuls* 210 (PRU); Harrismith, between Warden and Presidentskraal, 26 April 1946, *Acocks* 12570 (K, PRE); Amersvoort, Sterkfontein Farm, 30 March 1987, *Turner* 1582 (PRE, PRU); Klippiess Kraal, near Boshof, *Moran* 15662 (BOL); Deelfontein, 17 miles WNW of Parys, 14 Aug. 1954, *Mogg* 23681 (J); Ficksberg, farm Strathcona, 17 Oct. 1934, *Galpin* 14010 (BOL, K, P, PRE); near Vrededorp Road, Oct. 1902, *Captain Barrett-Hamilton* s.n. (holotype for *C. hamiltonii*, K); 4 miles SE of Bethlehem on Kestell road, 17 March 1967, *Scheepers* 1554 (K, PRE, S); Golden Gate National Park, 24 Jan., 1965, *Roberts* 3400 (PRE); Harrismith, Platberg, 2 May 1974, *Jacobsz* 2535 (PRE, K, NBG); Farm Bedford 389, 13 March 1998, *A. E. Van Wyk* 13121 (PRU); Witziesshoek, Feb. 1917, *Junod* 17403 (PRE); Edenburg, *Kotzé* 7422 (PRE); Bloemfontein, Naval Hill, 27 Sept. 1917, *Moss* 2605 (J); KwaZulu-Natal: Newcastle, Majuba Mt, 9 Nov. 1976, *Hilliard & Burt* 9215 (NU); Newcastle District, Bergwaters, 17 Dec. 1989, *Smit* 1295 (PRU); Estcourt, N face of Kamberg, 16 April 1967, *Wright* 196 (NH, NU, S); Northern Cape: Kimberley, Magersfontein, 26 April 1936, *Wilman* 3409 (BOL, PRE); 15 miles WSW of Carnarvon, 10 Sept. 1948, *Acocks* 14688 (K, PRE); Kareebospoort, 14 km from Carnarvon, 18 June 1977, *Smook & Harding* 805 (PRE, US); Victoria West, June 1976, *Jooste* 400 (PRE); 17 miles from Philippolis on Trompsburg-Philippolis road, 12 July 1941, *Warren* 178 (NBG, NU); Hantamsberg, 10 Oct. 1983, *Thomas* 416 (PRE); Fraserburg, at Dwaal R., 29 Aug. 1811, *Burchell* 1477 (G-DC, K); Richmond Distr., Renosterfontein, *Acocks* 15820 (K, PRE); Roelofsfontein, 31 May 1973, *Hanekom* 2095 (BM, PRE, UPS, WAG); Eastern Cape: Elandshoek, near Aliwal North, April 1917?, *Bolus* 28 (BOL); Zastron, Sept. 1934, *Heydorn* 11 (PRE); Barkly East Distr., descent from Naudés Nek on Rhodes side, 10 April 1966, *Hilliard* 3957 (NBG, NH, NU); 15 km from Rhodes to Naudés Nek, 3 April 1999, *Cron & Goodman* 550 (J); Maclear, Farm Wainwright, 19 May 1994, *Bester* 2804 (PRU); Middelburg Distr., Gordonville (Sneeuwberg), *Acocks* 16553 (PRE); Graaff-Reinet, Wagenpadsberg, March 1813, *Burchell* 2822 (K); Maraisburg, April 1944, *Thorns* s.n. sub NBG 29204; Aliwal North Distr., Jamestown, *Compton* 2152 (PRE); Broughton near Molteno, Dec. 1892, *Flanagan* 1599 (BOL, PRE, SAM); Mt Shepstone, near Queenstown, 28 May 1975, *Bayliss* B1435 (PRE, WAG); Elliott Distr., Tsomo Valley, Farm Ordiana, 19 April 1994, *Bester* 2782 (PRU); Transkei, Baziya, April 1867, *Bauer* s.n. (BM); Graaff-Reinet, *Ecklon & Zeyher* 538 (SAM, S); Oudeberg mountain sides near Graaff-Reinet, April 1867, *Bolus* 589 (BM, NBG, NH);

Table 3. Study of the variation in *Cineraria aspera* across the range of its distribution in terms of leaf lobe width, pattern of lobing, type of trichome, number of rays and involucre bracts.

Specimen	Locality & Grid Reference (QDS)	Altitude (m)	Leaf lobe width & leaf lobing (+ occurrence of fine trichomes)	Ave width of lobes (mm) (3 leaves measured)	Ave width of midrib region (mm) (3 leaves measured)	Number of Ray florets	Number of Involucral bracts
<i>Cron & Balkwill</i> 256 (K)	Moffat Park, Johannesburg 2627AA	1500	Broad lobes; palmate	4.3	4.7	7, 8	9 – 13
<i>Moss</i> 6822 (J)	Witpoortjie Kloof 2627BB	1650	Fairly broad	3.5	2.7	5	8
<i>Mogg et al.</i> 19780 (J)	Marais Kloof, Northcliff Ridge 2627BB	1750	Fairly narrow	1	1.3	6	8
<i>Mogg</i> 23101 (J)	Leeuwpoot Farm 2627AD	1675	Fairly narrow; somewhat palmate	1.6	1.6	8	8
<i>Mogg et al.</i> 26179 (J)	Weltevreden 156, Loopspruit 2627CB	1450	Fairly narrow; somewhat palmate	1.2	4.3	5? (old)	8 – 11
<i>Mogg & Lighton</i> 23294 (J)	Waterval 74 Krugersdrop 2627BA	1675 – 1716	Fairly broad; palmate	2.7	3.5	8	8
<i>Tait s.n. sub</i> PRE 45366	Potchefstroom 2627CA	1400	Narrow to broad; pinnatifid	1.4	2.3	5	9
<i>Mogg et al.</i> 23681 (J)	Deelfontein, Parys 2826BC	1448	Fairly narrow; somewhat palmate	1.1	1.3	7	10
<i>Jacobsz</i> 2535 (PRE, K, NBG)	Platberg, Harrismith 2829AC	2400	Broad lobes; palmate	4.2	7.3	8	8
<i>Van de Zeyde s.n. sub</i> NBG 92279	Farm Gravelotte Harrismith 2829AC	1785	Fairly broad; palmate	2.3	2.5	8	8
<i>Phillips & van Rensburg</i> 2001 (J)	Fauresmith 2925CB	1400	Fairly broad; somewhat palmate	2.7	3.2	5	8
<i>Moss</i> 2605 (J)	Naval Hill, Bloemfontein 2926AA	1495	Fairly narrow; pinnatifid; fine trichomes above	1.2	1.3	5	8
<i>Collett</i> 484 (K)	Teyateyaneng Lesotho 2927BA	1830	Narrow	1.5	1.2	8	8
<i>Cron</i> 12 (J)	Gaika's Kop Eastern Cape 3226DB	1800	Fairly narrow; pinnatifid; fine trichomes above	1.2	2.1	? (buds)	8
<i>Herman</i> 475 (PRE)	Near Colesberg 3025CA	1450	Narrow		2	5	8
<i>Bayliss</i> BS 1301 (WAG)	Pitsang Pass near Matatiele 3028CD	1220	Narrow	1.23	1.2	8	10

Table 3 (contd.)

<i>Hanekom</i> 2095 (WAG)	Roelofsfontein Richmond 3124 CB	1650	Narrow	1.43	1.3	5	8
<i>Bolus</i> 589 (BOL)	Oudeberg, near Graaf Reinet 3224DD	1220 – 1465	Narrow; fine trichomes	1.2	1	6, 8	8
<i>Flanagan</i> 1599 (SAM)	Broughton near Molteno 3126BC	1920	Very narrow; fine trichomes	0.9	0.9	8	8
<i>Hilliard & Burt</i> 10599 (K, NU)	Bankberg, Mountain Zebra National Park, Cradock 3225AB	1830	Very narrow; fine trichomes	0.8	0.8	8	8, 9
<i>Thunberg</i> 19896 (UPS) (type)	Cap. b. spei	?	Very narrow; fine trichomes			3 – 5	6, 8

Cradock Distr., Mountain Zebra National Park, *Brynard* 58 (PRE); Bankberg, 13 May 1952, *Hilliard & Burt* 10599 (K, NU); Boschberg Mts, April, *MacOwan* 1120 (K, NH); Tarka Distr., Great Winterberg, S of Tarkastad, Fairfield farm, 24 March 1954, *Comins* 796 (PRE); Queenstown, Shiloh, *Bauer* 786 (K); Amatole Mts, along Hogsback to Cathcart road, 6 April 1984, *Phillipson* 818 (K, UPS); Amatole Mts, Gaika's Kop, 15 Jan. 1990, *Cron* 12 (J); Western Cape: Coetzee's Kraal near Murraysberg, March 1879, *Tyson* 342 (SAM); Beaufort West, Karoo National Park, 31 Oct. 1984, *Bengis* 399 (PRE); Beaufort West Distr., Molteno Pass, 2 Dec. 1986, *Shearing* 1361 (PRE); Nuweveldeberge, *Drège* 785 (G-DC); Dordrecht, *Bayliss* 2103 (NBG, US); Cape of Good Hope, *Thunberg* 19896 (holotype UPS-THUNB).

HABITAT. Amongst rocks on hillsides or mountainsides, at the foot of cliffs, usually on the south-facing or south-east-facing aspects, also occasionally in disturbed sites such as roadsides and old kraals, predominantly on quartzites, rarely on dolomite [e.g. *Mogg & Lighton* 23294 (J)]; 1400 – 2600 m.

CONSERVATION STATUS. Least Concern. A widespread species, often locally abundant, and sometimes growing in disturbed areas.

LOCAL NAMES AND USES. Mohodu-wa-pela, moholu-oapela (Southern Sotho); geelrankbossie (Afrikaans). The leaf of *Cineraria aspera* is smoked by the Southern Sotho for asthma and tuberculosis, and is said to be as intoxicating as *Cannabis sativa* L. (Watt & Breyer-Brandwijk 1962).

NOTES. *Cineraria aspera* is a widespread species in South Africa that varies considerably in the breadth of the lobes of its leaves, the overall shape of its leaves (pinnatifid lobing to palmate outline), the

combination of trichomes and the size of capitula. There appears to be a cline from the Eastern Cape to the more northerly provinces of South Africa (North-West, Gauteng, Northern Cape): involving an increase in width of lobes and a tendency towards a more palmate pattern of lobing northwards. The size of the capitula also increases in some northerly populations (e.g. some capitula in *Cron & Balkwill* 256 (J) from Johannesburg have 13 involucre bracts).

A detailed study of this variation revealed that there is a tendency for populations of *Cineraria aspera* in the Eastern Cape to have narrow lobes, with broader ones occurring in the more northerly part of the range (viz. Gauteng, North-West Province and the north-eastern Free State (Table 3). However, specimens with narrow lobes also occur in these more northern regions. Breadth of lobes and leaf size is also influenced by whether the plant is growing in the sun or the shade, with broader lobes and larger leaves being a feature of plants growing in shade (Table 4). For example, *Cron & Goodman* 550 (J), growing in shade has a mean lobe width of 6.5 mm, while an adjacent plant, *Cron & Goodman* 551 (J), growing in sun, has a mean lobe width of 2.4 mm and a range of 1.6 to 2.5 mm (Table 4). Linked to the increase in width of lobes is a tendency towards a more palmate pattern of lobing in the more northern range of the distribution as compared to the more pinnatisect lobing in the Eastern Cape specimens.

Most specimens of *Cineraria aspera* have trichomes with c. 6 broadly-tapering basal cells and a long multi-celled apical appendage (Fig. 3C1), in contrast to the fine trichomes that occur mainly (but not exclusively) in the Eastern Cape populations, commonly associated with specimens with very narrow-lobed

Table 4. Study of the variation in *Cineraria aspera* in a population from Naudé's Nek (April 1999), in terms of leaf lobe width, leaf midrib width, number of rays and involucre bracts as correlated with growing conditions and altitude.

Specimen	Habit	Altitude (m)	Leaf lobe width (description)	Ave width of lobes (mm) (3 leaves measured)	Ave width of midrib region (mm) (3 leaves measured)	Number of Rays	Number of Involucral bracts
<i>Cron & Goodman</i> 549 (J)	Full sun	2200	Fairly broad	1.7	1.9	5	8
<i>Cron & Goodman</i> 550 (J)	Shade	2200	Broad	6.5	4.9	5	10
<i>Cron & Goodman</i> 551 (J)	Sun (adjacent to C & G 550)	2200	Fairly broad	2.4	3	5	8 (– 10)
<i>Cron & Goodman</i> 557 (J)	Mist belt	2600	Fairly narrow	1.2	1	7	10
<i>Cron & Goodman</i> 558 (J)	Near summit, in mist belt	2600	Fairly narrow	1.1	1.3	7 – 8	8

leaves [e.g. *Flanagan* 1599 (SAM); *Hilliard & Burt* 10599 (K, NU), as well as the type specimen, *Thunberg* 19896 (UPS-THUNB)]. Certain specimens (e.g. *Moss* 2605 (J) from Naval Hill, Bloemfontein, and *Cron* 12 (J) from Gaika's Kop in the Eastern Cape) have fine trichomes on the dorsal surface of their leaves and the broader-based trichomes on the leaves' ventral surface.

In a study of variation in a population of *Cineraria aspera* in the Eastern Cape in April 1999, five collections at different altitudes along Naudé's Pass near Rhodes were examined (Table 4). In this single population, leaf lobe width varied considerably [from narrow (1 mm) to broad (9 mm)], as did the width of the midrib region (0.8–8.0 mm). The capitula tended to be larger at higher altitude, as reflected in the number of ray florets per capitulum: plants at 2600 m have 7 or 8 rays per capitulum vs. plants at 2200 m with only 5 rays per capitulum (Table 4). In contrast, the number of involucre bracts appeared to be independent of altitude, with the range of 8–10 involucre bracts per capitulum occurring in all specimens. However, this altitudinal variation in the number of rays was not confirmed across the entire range of *C. aspera* (Table 3).

Specimens previously identified or cited as *Cineraria burkei* appear to have leaves with a more palmate lobing and multi-celled trichomes, but no consistent differences could be found to warrant the maintenance of two separate species or even subspecies as there was no distinct regional pattern of variation. Similarly, *C. hamiltoni* falls within the range of variation seen in *C. aspera*. Hence a single species is recognised and *C. burkei* and *C. hamiltoni* are placed in synonymy with *C. aspera*.

Cineraria aspera shows an affinity with *C. erosa*, but is distinguished from that species by having glabrous involucre bracts (with only a cobwebby calyculus), whereas *C. erosa* has cobwebby involucre bracts, usually glabrescent to some degree (but not glabrous). *C. aspera* generally has larger capitula (Fig. 10C), with 5–8 rays and 8–10 (rarely as many as 13) involucre bracts. In contrast, *C. erosa* has smaller capitula with 3–5 rays and 8 involucre bracts. The tip of the ray limb in *C. erosa* is characteristically sculpted into 3 tips, matching the venation. The pattern of the lobing is distinctly palmate in *C. erosa*, giving the leaves a reniform outline (Fig. 12E), which differs from the more pinnatisect lobing of *C. aspera* (Fig. 10D), particularly those occurring in the Cape. The breadth of the lobes is larger in *C. erosa* than in *C. aspera*, and there is a typical subdivision of each lobe into three in *C. erosa*.

Wells 3740 (K, PRE) and *Stokoe* s.n. sub SAM 60471 from the Prince Albert Distr. and *Moffett* 183 (PRE) and *Moffett* 599 (PRE) from Cango Valley near Oudtshoorn in the Western Cape all have cobwebby involucre bracts as in *Cineraria erosa*, yet the shape of their leaves is closer to that of *C. aspera* than *C. erosa*. They are at the east-west meeting point of the two species (Map 11) and could be the result of hybridisation occurring between them.

Cineraria aspera is listed as a problem plant as it may be competitive with desired vegetation, taint meat and milk [*Collett* 484 (K, PRE)] and be a seed contaminant (*Wells et al.* 1986). In addition to its more natural habitat amongst rocks on mountain slopes, it grows as a pioneer on roadsides and is reportedly grown as a fence around kraals in Lesotho.

20. *Cineraria cyanomontana* Cron in Cron & Balkwill (1997: 400). Type: South Africa, Limpopo Province, Bochum Distr., near summit of Blouberg Mt, 1900 m, 7 Dec. 1990, Cron, Scholes, Scholes & Christie 55 (holotype J!; isotype E!).

Perennial suffrutex, 0.3–0.45 m tall. *Stems* herbaceous, woody near the base, branching, canescent to tomentose, glabrescent towards the base. *Leaves* pinnatisect, elliptic to ovate in outline; lamina 18–69 × 14–44 mm, lobes 5 × 22 mm long with pinnule-like lobing, cobwebby to tomentose above, tomentose below; apex acute; margin entire with occasional tooth on pinnule; base truncate to subcordate; petiole 5–25 mm long, cobwebby to tomentose; auricles linear. *Capitula* heterogamous, radiate, 3–12(–25) arranged in a lax corymbose panicle; peduncles 7–32 mm long, cobwebby, sparsely bracteate, bracts c. 2 mm long. *Involucre* calyculate; phyllaries 8 or 9, 5.0–5.5(–6.0) mm, glabrous, green with purplish tips when fresh and young; margins scarious. *Ray florets* 7 or 8, 8.0–8.6 mm long; limb 5.0–5.6 mm long, 4-veined. *Disc florets* c. 32; corolla c. 4.5 mm long. *Cypselae* oblong to obovate, curved, compressed, margined to narrow-winged, dark brown with paler margins, c. 3.2 mm long, hairy on faces and margins. *Pappus* as long as disc floret corolla. Fig. 11B.

PHENOLOGY. Collected flowering in June and December.

DISTRIBUTION. South Africa, endemic to the Blouberg Mt in the Bochum Distr. of the Limpopo Province (Map 10).

SELECTED COLLECTIONS. SOUTH AFRICA: Limpopo Province: Bochum District, near summit of Blouberg, June 1953, Esterhuysen 21461 (BOL, K); *ibidem*, 1 June 1953, Esterhuysen 21520 (BOL); *ibidem*, 8 Dec. 1997, Cron, Knox & Winter 350 (J, K, S); *ibidem*, 7 Dec. 1990, Cron, Scholes, Scholes & Christie 55 (holotype J; isotype E).

HABITAT. The mist belt amongst the rocks and overhangs on the south- to south-westerly aspects of the ravines near the summit of the Blouberg Mt, and near Vulture Lake, medium to coarse-grained quartzites of the Wyliespoort Formation of the Soutpansberg Group; 1700–2000 m.

CONSERVATION STATUS. Very rare and restricted in its distribution, being endemic to one mountain, but fairly abundant in the few areas where it occurs on the mountain. Its area of occupancy is estimated at less than 2 km² with a population of less than 250 mature individuals, but probably not declining. It is therefore considered to be Vulnerable: VU D2.

NOTES. This species may only be confused with *Cineraria aspera*, but the lobes and pinnules of *C. cyanomontana* are essentially entire, whereas those of

C. aspera are dentate. In addition, the auricles of *C. cyanomontana* are linear compared to the auriform, dentate auricles of *C. aspera*. The fine trichomes on the leaves of *C. cyanomontana* consist of two or three agranular, narrow basal cells with a long, multi-celled apical appendage (Fig. 3D). In *C. aspera* they commonly comprise the type with 4–6 tapering basal cells and a long apical appendage (Fig. 3C1), although the fine type are present on some specimens.

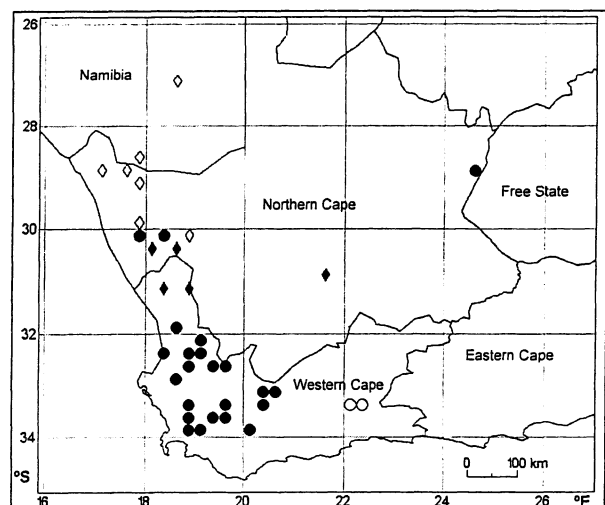
Cineraria cyanomontana is endemic to the Blouberg Mt, in the arid northern region of South Africa, where it grows in the mist belt on the southern side of the mountain, near the summit. Despite searches by the authors and others, it has not (as yet) been found on the adjacent Soutpansberg range, which is about 50 km apart for the afro-montane elements (Scholes 1978).

21. *Cineraria canescens* Wendl. ex Link (1822: 333); DC. (1838: 307); Harv. (1865: 310); Merxmüller (1967: 41); Goldblatt & Manning (2000: 312), (*non Spreng.*). Type: Cape of Good Hope, 1790, Hort. Kew ex Masson (holotype BM!; isotype K!).

Cineraria parviflora Aiton (1813: 72), *nom. illeg.*, (*non* M. Bieb. = *Caucasalia parviflora* (M. Bieb.) B. Nord.). Type: as above.

Cineraria aitoniiana Spreng. (1826: 547); Schtdl. (1835: 479), *synon. fide* DC. (1838: 307). Type: *siné loc.*, Sprengel Herb. Coll. 1352 (holotype P!).

Perennial suffrutex, to about 0.5 m tall. *Stems* woody, branching, typically very jointed at the nodes, grey, cobwebby (rarely tomentose), somewhat glabrescent, greener on new growth, lined. *Leaves* reniform, with



Map 11. Known distribution of *Cineraria canescens* var. *canescens* (◆), *C. canescens* var. *flabellifolia* (◇), *C. erosa* (●) and putative hybrids between *C. erosa* and *C. aspera* (○).

(3–)5(–7) shallow or distinct lobes, each lobe usually shallowly 3-lobed and often sharply dentate, sometimes with one or two small lateral pinnae below lamina; lamina 6–29 × 7–47 mm, grey/canescens or white, thickly to thinly cobwebby, often glabrescent above, thickly cobwebby to tomentose below, sometimes glabrescent, buds white-woolly (less so in var. *flabellifolia*); apex rounded; margin dentate (tips of teeth glabrous giving leaf ‘frilly’ look) or slightly crenate; base truncate to slightly cordate; petiole 5–38 mm long, tomentose to cobwebby, sometimes glabrescent; auricles small, auriform, toothed, occasionally absent. *Capitula* heterogamous, radiate, many (8–28 per stem branch) arranged in a compact (or rarely lax) corymb; peduncles (1.5–)5–20(–28) mm long, cobwebby, glabrescent (or glabrous in var. *flabellifolia*), bracteate. *Involucre* calyculate; phyllaries 8 or 9, rarely 13, (3.2–)4–6 mm long, thinly cobwebby, glabrescent, or glabrous (var. *flabellifolia*); margins scarious. *Ray florets* (3–)5 or 6, 5.0–8.5(–11.5) mm long; limb 2.5–5.0(–7.5) mm, 4-veined (rarely 5-veined). *Disc florets* (10–)18–20; corolla 3.5–6.0(–7.0) mm long. *Cypselae* obovate, compressed with prominent median rib when mature, margined, dark brown, c. 3.0 mm long when mature, ciliate and hairy to sparsely hairy on faces. *Pappus* 3–4 mm long (5–6 mm long in var. *flabellifolia*). Figs 11C, 12A–D.

PHENOLOGY. Flowering June to October, occasionally as late as December.

DISTRIBUTION. South Africa, Northern Cape, in the Kareeberg (Schlechter’s) and Khamiesberg in Namaqualand, northwards to near Springbok and possibly also in Namibia (Great Karasberg, Lord’s Hill) (Map 11).

HABITAT. In rock crevices or shade of large blocks, on mountain slopes, predominantly on granite; 570–1600 m (–2200 m in Namibia, var. *flabellifolia*).

CONSERVATION STATUS. Least Concern. However, *Cineraria canescens* var. *canescens* appears to be more restricted in distribution than *C. canescens* var. *flabellifolia* and both have specific habitat requirements, but these are currently not under threat (except from climate change). The size of populations is not known.

NOTES. This species is distinguished from *Cineraria erosa* by its indumentum, which comprises mainly fine narrow-based trichomes (Fig. 3D, E2) giving it a very grey (or white-woolly on younger parts) appearance (Fig. 12A–D). It does not have trichomes with tapering basal cells with the long apical appendage as evident in *C. erosa* (Fig. 12F–H), although a few trichomes with broad cells are evident on some leaves of some specimens of *C. canescens* var. *flabellifolia* from Namaqualand, but then these have glabrous involucre bracts, whereas those of *C. erosa* are thickly

cobwebby, although glabrescent to some degree. The degree of dissection and depth of lobing in the leaves is generally less in *C. canescens* than in *C. erosa*, and there are fewer lateral pinnae below the lamina; however the leaves on the type specimen of *C. canescens* resemble *C. erosa* quite closely. Certain specimens of *C. canescens* have very short internodes and a compact growth form, probably a response to the very arid conditions in which they grow. *Schlechter* 8278 (E, K, WAG) is a good match of the type of *C. canescens*, with both some larger leaves with longer internodes on a branch and some smaller ones on a very compact branch on the WAG specimen.

The Masson type of *Cineraria parviflora* was probably collected in Namaqualand, as Masson did journey as far north as the Khamiesberg during the period 1786 to 1795 (his third visit to South Africa), despite instructions from Banks for him to remain centred around Cape Town (Gunn & Codd 1981). The name ‘*C. parviflora*’ was illegitimate as it had been previously applied by Marschall von Bieberstein (1808: 316) to plants now considered to be *Caucasalia parviflora* (M. Bieb.) B. Nord. (Nordenstam 1997: 29).

Cineraria canescens var. *flabellifolia* has more rounded leaves, with shallower lobing, and slightly larger capitula with the glabrous involucre bracts subtended by glabrous peduncles, as opposed to cobwebby or tomentose, glabrescent involucre bracts and peduncles in var. *canescens*. Harvey (1865: 310) distinguished *C. canescens* var. *flabellifolia* Harv. from var. *canescens* by its ‘having no lateral leaf-lobes, a broader lamina and a denser and more glabrous inflorescence.’ However, *Salter* 797 (K, sheet 1) has very small lateral pinnae on a few (about two) leaves. The trichomes on the type of var. *flabellifolia* are of the fine type; however, some of the other specimens from Namaqualand have trichomes with larger basal cells, gradually tapering to join with the fine apical appendage.

An extremely tomentose form of *Cineraria canescens* var. *flabellifolia* from Lord’s Hill, Karasburg in Namibia, known from two collections [*Örtendahl* 500 (K, UPS) and *Pearson* 7922 (K)], also has glabrous involucre bracts and fine trichomes. However, these specimens have larger leaves with shallow lobing and lack auricles. These plants could be an extension of the taxon northwards, but molecular evidence is needed to definitely conclude this. In contrast, *Pearson* 6239 (BOL, K) is extremely glabrescent to almost glabrous, but matches *C. canescens* var. *canescens* in terms of leaf shape, branching, size and density of capitula.

It is possible that *Cineraria canescens* is a more northerly form of *C. erosa* with a transition region in between. However without substantial evidence in the form of molecular studies at the population level, we have maintained the two species as separate.

Key to varieties of *Cineraria canescens*

- Leaves more deeply lobed; smaller capitula (3–5 rays); involucre bracts cobwebby or tomentose, slightly glabrescent var. **canescens**
 Leaves more rounded with shallower lobes; larger capitula (5 or 6 rays); involucre bracts glabrous or glabrescent var. **flabellifolia**

Cineraria canescens Wendl. ex Link var. **canescens**

Stems often very jointed at the nodes, grey, cobwebby, somewhat glabrescent, greener on new growth, lined. *Leaves* reniform, with (3–)5(–7) distinct lobes, each lobe usually shallowly 3-lobed and very sharply dentate, sometimes with one or two small lateral pinnae below lamina; lamina 6–29 × 7–47 mm, canescent, thickly or thinly cobwebby, often glabrescent above, thickly cobwebby to tomentose below, also sometimes glabrescent; apex rounded; margin dentate (tips of teeth glabrous giving leaf 'frilly' look); base truncate to subcordate; petiole 5–38 mm long, tomentose to cobwebby, sometimes glabrescent; auricles small, auriform, toothed. *Capitula* many (8–28) per stem branch in a compact or lax corymb; peduncles 1.5–19(–28) mm long, cobwebby, glabrescent, bracteate. *Involucral bracts* 8, 3.2–4.5 mm long, thinly cobwebby, glabrescent. *Ray florets* 3–5, 5.0–8.5 mm long; limb 2.5–5.0 mm long, 4 (rarely 5)-veined. *Disc florets* 15–20; corolla 3.5–5.0 mm long. *Cypselae* margined, dark brown, ciliate and hairy to sparsely hairy on faces. *Pappus* 3–4 mm long.

SELECTED COLLECTIONS. SOUTH AFRICA: Northern Cape: Kamiesberg, near top of Sneekop, 14 Oct. 1928, *Hutchinson* 859 (BOL, K); Sneeuwkop, 11 Dec. 1910, *Pearson* 5762 (BOL, NBG) (glabrescent form); Leliefontein, foot of Ezelskop, Little Namaqualand, Nov. 18??, *Drège* 6356 (G-DC, P, S); Great Namaqualand: De Kom (now farm Karas) 3 miles from Leliefontein in the Khamiesberg, Oct. 1940, *Leipoldt* 3274 (BOL); Khamiesberg Plateau, 15 Jan. 1911, *Pearson* 6239 (BOL, K); 15 miles N of Aalwynfontein, *Pearson* 3932 (BOL, G-DC); Kareeberg, 23 July 1896, *Schlechter* 8274 (BM, BOL, E, K, PRE, US); *ibidem*, *Schlechter* 8278 (E, K, WAG); Niewerust, 4 Dec. 1910, *Pearson* 5512 (BOL, G-DC); Cape of Good Hope, *Masson* (holotype BM; isotype K).

Cineraria canescens Wendl. ex Link var. **flabellifolia** Harv. (1865: 310). Type: South Africa, Northern Cape, Modderfontein (farm W of Springbok), *Rev. H. Whitehead* (holotype TCD!).

Cineraria albicans auct. non N. E. Br. (*Bolus et al.* 1914: 73) synonym. *fide* Merxm. (1967: 41).

Stems very tomentose in younger parts (grey or white-woolly to velvety), glabrescing slightly with age. *Leaves* reniform in outline, very shallowly 5–7-lobed; lamina 9–24 × 11–40 mm, thinly cobwebby above (thickly cobwebby in specimens from Karasberg), glabrescent, thickly cobwebby, glabrescent below (tomentose white woolly or velvety below in specimens from Karasberg); apex rounded; margin dentate to crenate; base truncate to cordate; petiole 8–24 mm long, thickly cobwebby. *Capitula* 10–28 per branch in a compact corymbose panicle; peduncles 5–20 mm long, glabrous or almost glabrous, sparsely bracteate. *Involucral bracts* 8–13, (3.5–)4–6 mm long, glabrous; margins scarious. *Ray florets* 5 or 6, 5.2–8.5(–11.5) mm long; limb 3.0–5.5(–7.5) mm long, 4 (rarely 5)-veined. *Disc florets* 10–20; corolla (3.5–)4–6(–7) mm long. *Pappus* 5–6 mm long.

SELECTED COLLECTIONS. NAMIBIA: Great Karas Mts, Lord Hill, 26 June 1931, *Örtendahl* 500 (K, PRE, S, UPS); *ibidem*, 17 Jan. 1913, *Pearson* 7922 (BOL, K). SOUTH AFRICA: Northern Cape: Kalkfontein, Richtersveld, 23 Aug. 1925, *Marloth* 12650 (PRE); Namaqualand, Hester Malan Veldblom Reservaat, Springbok, 31 May 1974, *Rosch & Le Roux* 421 (PRE); Little Namaqualand, Springbok, July 1926, *Meyer* 6960 (PRE); Farm Modderfontein, W of Springbok, *Rev. H. Whitehead* (holotype TCD); Droedap, 27 Aug. 1941, *Compton* 11560 (BOL, NBG); Kamieskroon, 6 June 1931, *Salter* 797 (BM, K); Aus, 12 Sept. 1897, *Schlechter* 11208 (BM, P, PRE, S, US, WAG, Z); Leliefontein, 27 Sept. 1932, *Levyyns* 4044 (BOL).

NOTES. The pappus of *Cineraria canescens* var. *flabellifolia* is a useful diagnostic character as it appears more setose in older capitula. The specimens from Lord Hill in the Karas Mts, Namibia are a possible match of *C. canescens* var. *flabellifolia*. They have very tomentose leaves and stems and the leaves are larger than plants from Namaqualand. Their capitula are very old (or absent), but appear to have glabrous involucre bracts and ciliate and hairy cypselae.

22. *Cineraria erosa* (Thunb.) Willd. (1803: 2073); Spreng. (1826: 552); DC. (1838: 309); Harv. (1865: 309); Goldblatt & Manning (2000: 312). Type: South Africa, Riebeek Kasteel et Paardeberg, *Thunberg* 19829 (holotype UPS-THUNB!).

Doria erosa Thunb. (1800: 156); (1823: 674). Type: as above.

Cineraria oxyodonta DC. (1838: 306). Types: South Africa, Western Cape: Paarlberg, 305–610 m [1000–2000'], Nov., Dec. 1927, *Drège* 5905 (syntype G-DC!, P!); Worcester, Nieuwekloof, *Ecklon* 1531 (syntype G-DC!).

Perennial spreading shrublet, to about 0.6 m tall. *Stems* woody, branching, cobwebby, sometimes glabrescent, lined. *Leaves* reniform in outline, shallowly to deeply 3–5-lobed and lobes are again divided (usually into three) or pinnatilobed, frequently with lateral pinnæ below lamina, upper leaves often very pinnatisect; lamina 6–28(–35) × 7–40 mm, thickly to thinly cobwebby above, glabrescent, thickly cobwebby to tomentose below, grey/canescens to white-woolly, young leaves and buds very white-woolly; apex obtuse to acute; margin dentate; base subcordate to cordate; petiole 8–47 mm long, cobwebby, slightly glabrescent; auricles conspicuous or inconspicuous, auriform, dentate. *Capitula* heterogamous, radiate, small, few (e.g. 8–12) to many (18–52) per stem branch arranged in lax corymbose panicles; peduncles 2–15(–24) mm long, cobwebby, bracteate. *Involucre* calyculate; phyllaries 6–8, 3.8–4.5 mm (rarely up to 5.0 mm) long, cobwebby, usually glabrescent to some degree but not glabrous; margins scarious. *Ray florets* 3–5, 5–7(–8) mm long; limb 2.5–4.0(–5.0) mm long, tip clearly sculpted into 3, 4-veined. *Disc florets* 8–15; corolla 3.5–4.3(–5.0) mm long. *Cypselae* obovate, compressed, margined, dark brown when mature, 3.0–3.5 mm long, ciliate and sparsely hairy to hairy. *Pappus* 3.5–4.0 mm long. Fig. 11D.

PHENOLOGY. Flowering October to January.

DISTRIBUTION. South Africa: Western Cape, from the Piketberg and Cederberg eastwards to Riebeeck Kasteel, Ceres and Paarl Mt, the Drakenstein mountains near Worcester, the Witteberg near Laingsburg and the mountains near Stellenbosch and Montagu; also in the Northern Cape: near Leliefontein in Namaqualand. A putative hybrid with *Cineraria aspera* occurs in the Swartberg mountains near Prince Albert (Map 11).

SELECTED COLLECTIONS. SOUTH AFRICA: Northern Cape: Koppie SW of Leliefontein Mission station, 16 Jan. 1911, *Pearson* 6308 (BOL, K); Western Cape: Van Rhynsdorp, Gifberg, 14 Oct. 1956, *Esterhuysen* 21994 (BOL, PRE); Rooikransberg, near Verloren Vlei, Piketberg, 18 Oct. 1935, *Pillans* 7970 (K); Uitkyk, 3 Dec. 1934, *Compton* 4811 (NBG); Skimmelberg, 12 Oct. 1939, *Pillans* 9098 (BOL); Candouw Pass, 4 Nov. 1951, *Johnson* 307 (NBG); Saron near Tulbagh, Farm De Hoop, 18 Sept. 1980, *Schonken* 327 (K, PRE); Cederberg, Tafelberg, Oct. 1921, *Pillans* 14159

(BOL); Cederberg, Pakhuis Pass, *Viviers* 812 (PRE); Klein Baliesgat, Ceres, Koue Bokkeveld, 8 Oct. 1969, *Hanekom* 1308 (K, PRE); between Gansfontein and Papkuil, Dec. 1908, *Pearson* 5035 (BOL, K); Riebeeck Kasteel et Paardeberg, *Thunberg* 19829 (holotype UPS-THUNB); Paarlberg, 9 Nov. 1927, *Drège* 5905 (syntype for *C. oxyodonta* G-DC, P, S); *ibidem*, 12 Dec. 1927, *Drège* s.n. (P, S); Paarl Mt, 31 Jan. 1996, *Cron & Perrett* 329 (J, K, NH, PRE); Banhoek, Stellenbosch, 11 Jan. 1941, *Compton* 10348 (NBG); Stellenbosch, *Harvey* s.n. (BM); Ceres, Karoo Poort, 19 Sept. 1937, *Levyns* 6241 (BOL); Hottentots Kloof, 29 Nov. 1908, *Pearson* 4900 (BOL, K, SAM); Drakenstein Mts, Dec. 1939, *Stokoe* 7169 (BOL); Worcester, Nieuwekloof, *Ecklon* 1531 (syntype for *C. oxyodonta* G-DC); Worcester, Tafelberg, Oct. 1921, *Pillans* 14159 (BOL, NBG); Laingsburg, Witteberg Kloof, 30 Nov. 1924, *Compton* 2821 (BOL, K); Pieter Meintjies, Dec. 1920, *Marloth* 9968 (PRE); Matjiesfontein, *Folen* 34 (PRE); Montagu, Baden Kloof, 22 Sept. 1946, *Compton* 18358 (NBG).

Possible hybrids between *Cineraria erosa* and *C. aspera*: Western Cape: Oudtshoorn, Boomplaas, Cango Valley, 26 June 1974, *Moffett* 183 (PRE); *ibidem*, *Moffett* 599 (PRE); Prince Albert Distr., Schoemanspoort, 19 Oct. 1966, *Wells* 3740 (K, PRE); Prince Albert Distr., Swartberg mts, Nov. – Dec. 1945, *Stokoe* s.n. sub SAM 60471 (SAM).

HABITAT. On rocky mountains, at the base of large boulders or in rock crevices, in moist shady places or quite dry, usually associated with granite; 300–1750 m.

CONSERVATION STATUS. Least Concern. A fairly widespread species in the Western Cape but not common, although it may be fairly abundant in the right habitat at a specific locality.

NOTES. *Cineraria erosa* is characterised by very deeply lobed leaves with a reniform outline (Fig. 12E) and a 'frilly' appearance due to lobing and dentition with the lobes often divided into three or pinnatilobed and dentate. The capitula are small (3–5 rays) and involucre bracts are cobwebby, glabrescent but not glabrous. This helps to distinguish *C. erosa* from *C. aspera*. The trichomes have a tapering multi-celled base of 4–6(–8) cells and a long multi-celled apical appendage (Figs 3C1, 12F–H). The appendage often breaks off creating a papillose appearance to the leaves, what Thunberg (1823: 674) referred to as 'Folia ...tota scabra, papillis minutis simis eminentibus, subtus pubescentia'.

This species is also very similar to *Cineraria canescens*, distinguished mainly by the degree of the dissection of the leaves and the types of trichomes, where *C. canescens* mainly has fine trichomes, or ones with broader bases (in some specimens of *C. canescens* var. *flabellifolia*), but not sharply tapering as in *C. erosa*. Some anomalous specimens include: *Pole*

Evans H-15841 (K) from Taungs, which has leaves like *C. erosa* and the trichomes match, but it has glabrous involucre bracts and a very disjunct distribution pattern; *Pillans 14159* (BOL) from the Cederberg has the very dissected leaf of *C. erosa*, but lacks the typical trichomes, having only the fine trichomes (like *C. canescens*).

Some specimens from the Clanwilliam/Cederberg/Piketberg area have much more shallowly lobed leaves and some have very glabrescent involucre bracts (similar to *Cineraria canescens*). However their trichomes match those of *C. erosa*: *Esterhuysen 18152* (BOL), *Pillans 9098* (BOL), *Hanekom 1308* (K), *Pillans 7579* (BOL), *Compton 4811* (NBG), *Pillans 7970* (BOL, K). Isozyme studies at the population level are required to fully investigate the relationship between *C. erosa* and *C. canescens*.

23. *Cineraria mazoensis* S. Moore (1908: 43). Type: Zimbabwe, Mazoe, Iron Mask Hill, 1525 – 1585 m [5000 – 5200'], April 1906, *F. Eyles 349* (holotype BM!; isotype BOL!).

Perennial, possibly short-lived, single or multi-stemmed herb, to c. 1 m tall. *Stems* herbaceous, slightly woody and sometimes branching near the base, cobwebby, sometimes glabrescent. *Leaves* deltoid-reniform to reniform in outline, distinctly (3 –)5 – 7-lobed with deep rounded sinuses, occasionally with lateral pinnae, 10 – 66 × 13 – 72 mm, green and cobwebby above, glabrescent, white or grey and thickly tomentose below; apex obtuse to acute; margin dentate; base truncate to subcordate to cordate, uppermost leaf forming bract below peduncles with acute base; petiole 10 – 43 (– 56) mm long, tomentose on younger leaves, sparsely cobwebby on mature leaves; auricles conspicuous or very small (rarely absent), ovate to auriform, sometimes extending along petiole (especially on uppermost leaves). *Capitula* heterogamous, radiate, few (4 – 17 per stem branch) arranged in lax corymbose panicle; peduncles (2 –)10 – 47(– 67) mm long, glabrous or cobwebby especially near bracts. *Involucre* calyculate, calyculus bracts few, descending; phyllaries 10 – 13, 4 – 5 mm long, cobwebby or glabrous, with scarious margins. *Ray florets* 7 or 8, 6.0 – 8.5 mm long; limb 3.5 – 5.0 mm long, 4-veined (rarely more). *Disc florets* 25 – 40; corolla 3.5 – 5.0(– 6.0) mm long. *Cypselae* obovate, compressed, margined to narrow-winged, brown, 2.2 – 2.8 mm long when mature, sparsely to moderately ciliate; faces sparsely to densely hairy, some almost glabrous. *Pappus* as long as or slightly longer than disc corolla. Fig. 11E.

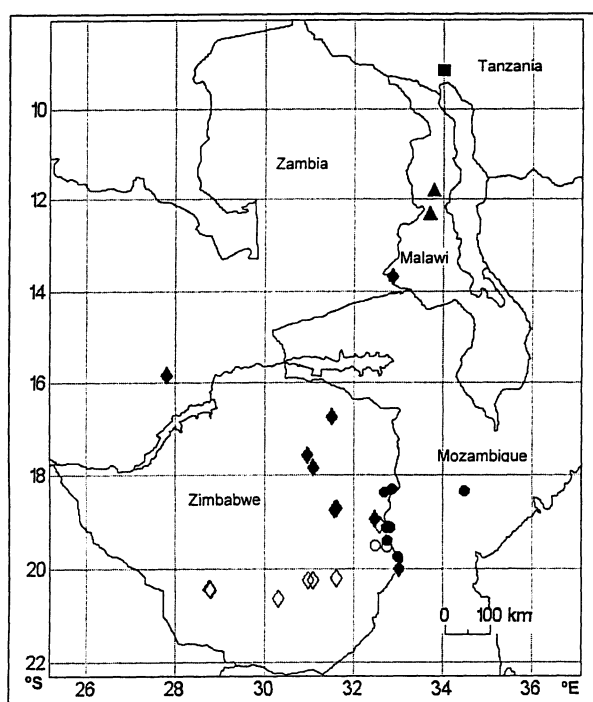
PHENOLOGY. Flowering April to June.

DISTRIBUTION. Mainly known from Zimbabwe, occurring from the Matobo region in the southwest, to near Lake Mutirikwi and the Bikita region in the south, northward to Wedza Mountain, Mazoe and Mt Darwin NE of Harare and Mutare to the E. Also known from the Mchinji Mts in Malawi and from Mazabuka in Zambia. (Map 12).

HABITAT. *Cineraria mazoensis* var. *mazoensis*: on slopes of hills, on river gorge walls, among boulders, on pyroxenite hill; *C. mazoensis* var. *graniticola*: at the foot or on 'shelves' of huge granite domes, or in wooded gully amongst granite domes or hills; 1100 – 1650 m in Zimbabwe; 1905 m in the Mchinji Mts, Malawi.

CONSERVATION STATUS. Data Deficient. *Cineraria mazoensis* var. *mazoensis* is fairly widespread, but occurs in small populations requiring a specific habitat. *C. mazoensis* var. *graniticola* is more vulnerable than *C. mazoensis* var. *mazoensis* due to its more restricted distribution and even smaller populations. The species' habitat is under threat from human activities such as burning in certain areas of Zimbabwe, notably on Wedza Mt (Robertson 1991).

NOTES. *Cineraria mazoensis* is characterised by a grey tomentum and deep sinuses between the lobes in the deltoid-reniform (to reniform) leaves (Fig. 13A). It is a herb, as opposed to the shrubby *C. pulchra*, usually lacking the very prominent venation on the undersurface of the leaves of that species, and is not as discolorous. It is very similar to *C. foliosa* from the



Map 12. Known distribution of *Cineraria foliosa* (■), *C. mazoensis* var. *mazoensis* (◆), *C. mazoensis* var. *graniticola* (◇), *C. pulchra* (●), putative hybrids between *C. pulchra* and *C. deltoidea* (○) and *C. magnicephala* (▲).

southern highlands of Tanzania, although that species has smaller capitula and is much more thinly cobwebby and glabrescent. More field observation and collecting is needed (of both species, especially in southern Tanzania and potential habitats in Malawi to search for intermediate populations) to establish whether *C. mazoensis* and *C. foliosa* are conspecific. Molecular work (isozyme studies and DNA sequencing) would also aid this investigation.

Cineraria mazoensis var. *mazoensis* is distinguished from *C. mazoensis* var. *graniticola* by having cobwebby involucre bracts and peduncles and a different trichome complement on the leaves. *C. mazoensis* var. *mazoensis* has predominantly fine trichomes (Fig. 3D)

on both surfaces of the leaf. It frequently has lateral pinnae on the petiole of the leaf, uncommon in var. *graniticola*. *C. mazoensis* var. *graniticola* has glabrous involucre bracts and peduncles, slightly smaller capitula, usually 7 rays (occasionally 8) and the auricles of its uppermost leaves are procurvent.

The cobwebby upper surface of the leaves of *Cineraria mazoensis* var. *graniticola* is created by broad-based, multi-celled, long trichomes (Fig. 3C1), while the grey dense tomentum of the lower surface is created by fine woolly trichomes. These hairs act like 'Velcro®', sticking most effectively when the leaves are fresh. The long apical cells twist like a cork-screw creating the adhesive nature of the hairs.

Key to varieties of *Cineraria mazoensis*

- Involucre bracts and peduncles cobwebby, glabrescent, ventral surfaces of leaves do not stick together var. **mazoensis**

 Involucre bracts and peduncles glabrous, ventral surfaces of leaves stick like Velcro® when fresh var. **graniticola**

Cineraria mazoensis S. Moore var. **mazoensis**

Perennial herb, to c. 0.40 m tall. *Leaves* (3–)5–7-lobed, thickly tomentose below; trichomes on dorsal surface agranular with narrow, slightly tapering basal cells and long multi-celled apical appendage, trichomes on ventral surface with 2–4 narrow basal cells (not tapering) and long apical appendage (Fig. 3D). *Peduncles* thickly or thinly cobwebby, especially near bracts. *Involucre bracts* cobwebby, sometimes glabrescent, remaining cobwebby amongst calyculus bracts, 12–13. *Ray florets* commonly 8 (rarely 7). *Disc floret* corolla 3.5–3.8 mm long.

SELECTED COLLECTIONS. MALAWI: Mchinji Mts near Mchinji (Fort Manning), 7 Aug. 1936, B. D. Burt 6200 (BR, K). ZAMBIA: Mazabuka, 20 May 1961, Fanshawe F6591 (BR, K). ZIMBABWE: Mt Darwin, Mvuradona Mts, 16 April 1964, Wild 6528 (K); Mazoe, Iron Mask Hill, April 1906, Eyles 345 (holotype BM, isotype BOL); Harare, 25 March 1984, Bayliss 10147 (MO); Romorehota, northern summit of Wedza Mt, 16 May 1998, Cron & Balkwill 486 (J, K, MO, PRE); Mutare, Spinney Hill, Christmas Pass, 22 June 1946, Chase 223 (BM, K); Chimanimani, Haroni Valley, Chimanimani foothills, 21 April 1962, Wild 5720 (K).

Cineraria mazoensis S. Moore var. **graniticola** Cron in Cron *et al.* (2006b: 171). Type: Zimbabwe: S of Lake Mutirikwi, 1064 m, 21 May 1998, Cron & Balkwill 532 (holotype J!; isotypes B!, E!, K!, PRE!, S!, SRGH!).

Perennial herb to about 1.0 m tall. *Leaves* 5–7-lobed, thinly tomentose to cobwebby below; trichomes on dorsal surface usually with granular, broader tapering basal cells with long apical appendage, trichomes on ventral surface with 4–8 basal cells (narrowly tapering or not) with long apical appendage that twists like a cork screw, creating a Velcro® effect when similar surfaces touch. *Peduncles* glabrous. *Involucre bracts* glabrous, 10–13. *Ray florets* usually 7, occasionally 8. *Disc floret* corolla 4–5 mm long.

KNOWN COLLECTIONS. ZIMBABWE: Mutare, Dora Farm, 26 June 1948, Chase 802 (BM, K); *ibidem*, 26 June 1948, Fisher 1614 (NU); Matobo Distr.: Farm Quaringa, April 1955, Miller 2776 (K); *ibidem*, March 1959, Miller 5862 (K); Besna Kobila, April 1958, O. B. Miller 5222 (K); *ibidem*, April 1962, O. B. Miller 8250 (K); *ibidem*, April 1957, O. B. Miller 4293 (K); Western side of Lake Mutirikwi, 9 Aug. 1988, Carter & Coates-Palgrave 2224 (K); Mt Buhwa, 29 Oct. 1973, Mahohoma 31 (K); Buhwa Hill, 5 July 1968, Müller 783 (MO); S of Lake Mutirikwi, 21 May 1998, Cron & Balkwill 532 (holotype J, isotypes B, E, K, PRE, S, SRGH); Bikita Distr., confluence of the Turgwe and Dafana Rs., 4 May 1969, Biegel 3005 (K, PRE, S).

24. *Cineraria foliosa* O. Hoffm. (1902: 434). Type: Tanzania, Kingagebirge (Ukinga Berge): Kipengere-Rücken, 2700 m, 28 May 1899, Goetze 973 (holotype B†, lectotype designated here K!, isolectotypes BM!, E!, K!, P!).

Perennial herb (or suffrutex?), up to 1 m tall. *Stems* woody, branching slightly towards the base, slightly cobwebby, glabrescent, lined. *Leaves* deltoid to deltoid-reniform in outline, distinctly 5–7-lobed, sharply dentate, occasionally with a pair of pinnae below lamina on uppermost leaves; lamina 11–30 × 17–42 mm, green, glabrous or slightly cobwebby, glabrescent above, slightly cobwebby below, mainly on veins and at base of lamina, glabrescent; apex acute to obtuse; margin coarsely dentate; base subcordate in upper leaves to cordate in middle to lower leaves; petiole 17–53 mm long, cobwebby, glabrescent; auricles fairly conspicuous, auriform, persistent. *Capitula* heterogamous, radiate, many (c. 23–30 per branch) arranged in a lax corymb; peduncles 7–22 mm long, slightly cobwebby (axils thickly cobwebby/woolly), bracteate, bracts linear to triangular, 2.5–4.0 mm long (–8.0 mm at base). *Involucre* sparsely calyculate, calyculus bracts descending peduncle; phyllaries 8(–11), 4.0–4.5 mm long, glabrous, but with white ‘fringe’ of hairs on apex and slightly cobwebby at base amongst calyculus bracts; margins scarious. *Ray florets* 5 or 6(–7), 7–9 mm long; limb 5–7 mm long, 4-veined. *Disc florets* c. 17–20; corolla 4.0–5.0 mm long. *Cypselae* obovate, compressed, margined, dark brown with paler margin, c. 2.2 mm long (not quite mature), ciliate or sparsely ciliate with sparsely hairy or glabrous faces. *Pappus* c. 4 mm long. Figs 11F, 13B.

PHENOLOGY. Flowering May.

DISTRIBUTION. Known only from the Kipengere range near Lake Nyassa from Southern Tanzania (Map 12).

HABITAT. On mountain slopes in the shade of rocks or boulders, montane grassland, 2700 m.

CONSERVATION STATUS. Critically Endangered: CRB1ab(iii)+2ab(iii). Very rare and restricted in distribution. The Kitulo Plateau is a newly proclaimed National Park (T. Davenport, *pers. comm.*) in the Southern Highlands of Tanzania, a centre of endemism. The forests and grasslands are severely threatened by unsustainable land-use practices and exploitation (SHCP 2002).

NOTES. *Cineraria foliosa* is fairly similar to *C. mazoensis*, but has only slightly cobwebby leaves (Fig. 13B), while *C. mazoensis* has quite tomentose leaves, especially ventrally. *C. foliosa* has slightly smaller capitula (commonly 5 or 6 rays; 8 involucre bracts) than *C. mazoensis* and glabrous involucre bracts, unlike *C. mazoensis* var. *mazoensis*, but similar to *C. mazoensis* var. *graniticola*. However it does not possess the trichomes that cause the ventral surfaces of its leaves to stick together as are found in *C. mazoensis* var. *graniticola*.

The Kipengere Range lies in the northeastern part of the Southern Highlands of Tanzania, which are geologically quite complicated, with old sedimentary and metamorphic ranges penetrated by

more recent volcanics. The vegetation comprises floristically-rich high-altitude grassland and montane forest with a significant endemic or near endemic component in both grassland and forest (Beentje *et al.* 1994). Of the 350 vascular plants documented to date, 31 species are Tanzanian endemics and 16 are restricted to the Kitulo plateau/Kipengere range (SHCP 2002).

The exact locality of the type collection is uncertain. However, based on the map of Goetze’s route on 28 May 1899, it is likely to be on or near Mt Mtorwi (2960 m) on the northern edge of the Kitulo Plateau (D. & R. Polhill, *pers. comm.*). Although granite is present in the region, the mountain peaks in no way resemble the granite inselbergs of Zimbabwe, where *Cineraria mazoensis* var. *graniticola* occurs, suggesting that *C. foliosa* and *C. mazoensis* are not the same species. We therefore retain them as distinct species until further field work can be done in southern Tanzania and Malawi.

25. *Cineraria pulchra* Cron in Cron *et al.* (2006b: 168). Type: Zimbabwe, Vumba, summit of Castle Beacon, 1900 m, 19 May 1998, Cron & Balkwill 510c (holotype J!; isotypes K!, MO!, PRE!, SRGH!).

Perennial suffrutex or spreading shrub, to 1.2 m tall, often spreading or rambling. *Stems* woody and branching near the base, rooting along decumbent stems, tomentose to cobwebby, glabrescent. *Leaves* deltoid-reniform to reniform in outline, deeply 5–7-lobed with rounded sinuses between lobes, with 1 or 2 pairs of lateral pinnae; lamina often extending along petiole, 26–55 × 26–63 mm (excluding lateral pinnae at base), green, cobwebby, glabrescent above, tomentose white or grey below with very prominent venation; apex acute to obtuse; margin dentate; base truncate to subcordate (to cordate), often merging with lateral pinnae; petiole 20–72 mm long (including portion supporting lateral pinnae), tomentose, sometimes glabrescent; auricles very conspicuous, auriform and procurrent. *Capitula* heterogamous, radiate, many (12–60 per stem branch), in a compact corymbose cyme; peduncles 3–14 mm long, thickly cobwebby, glabrescent, distinctly bracteate near capitula, bracts lanceolate to linear, 3–6 mm long. *Involucre* calyculate; phyllaries 8–12, 4.0–5.0 mm long, thickly or thinly cobwebby, occasionally glabrescent; margins scarious. *Ray florets* 8(–13), 5–9(–11) mm long; limb 4.0–6.0(–8.5) mm long, 4- (rarely 5-) veined. *Disc florets* 26–43; corolla 4(–5) mm long. *Cypselae* obovate, compressed with distinct median rib on inner surface, margined, sometimes appearing narrow-winged when immature, dark brown when mature, c. 2 mm long, ciliate and sparsely to moderately hairy

on the faces, rarely glabrous. *Pappus* 3.5–4.0 mm long. Figs 11C, 13C.

PHENOLOGY. Flowering from March to July, mainly in April and May, although flowering specimens from Mozambique have also been collected in September and October.

DISTRIBUTION. From Nyangani, Vumba and the Chimanimani Mts in the eastern highlands of Zimbabwe and from Mt Gorongosa and the Chimanimani Mts in Mozambique. (Map 12).

SELECTED COLLECTIONS. MOZAMBIQUE: Manica e Sofala Distr., Mt Gorongosa, 23 July 1970, *Müller & Gordon* 1416 (K, LISC); Manica e Sofala, Serra da Gorongosa, 21 Oct. 1965, *Torre & Pereira* 12495 (LISC); Manica e Sofala, Gorongosa, 26 Sept. 1943, *Torre* 5949 (LISC); Chimanimani Mts, 4 June 1948, *Munch* 93 (K, LISC). **ZIMBABWE:** Nyanga, Nyangani, 17 May 1998, *Cron & Balkwill* 499 (E, J, K, MO, PRE, SRGH); summit ridge of Nyangani, April 1935, *Gilliland* 1891 (BM); Mutare, SW side of Castle Beacon, Vumba Mts, 24 May 1966, *Chase* 8422 (K, PRE); Vumba, Summit of Castle Beacon, 19 May 1998, *Cron & Balkwill* 510c (holotype J, isotypes K, MO, PRE, SRGH); track to Castle Beacon, 19 May 1998, *Cron & Balkwill* 504 (B, J, K); Vumba, Chikwera Peak, 20 May 1956, *Chase* 6127 (BM, BR, K, PRE); Chimanimani Mts, 6 June 1949, *Wild* 2867 (K); Chimanimani, May 1956, *K. Coates-Palgrave* 70616 (K, SRGH); Chimanimani, Mt Peni, July 1968, *Goldsmith* 110/68 (COI, K, PRE).

Putative *Cineraria pulchra* × *C. deltoidea* hybrids: Cashel-Chimanimani Road, *Levyns* 9935 (BOL); Cashel-Chimanimani road, 20 May 1998, *Cron & Balkwill* 519 (J, K); *ibidem*, *Cron & Balkwill* 520 (J, PRE); *ibidem*, 20 May 1998, *Cron & Balkwill* 525 (J, MO); between Cashel and Chimanimani (Melsetter), 10 July 1953, *Schelpe* 4019 (BM).

HABITAT. Grows between rocks on mountain summits or on south-facing, south-eastern and eastern slopes, usually in the mist belt near the summit of mountains, in ericoid scrub above the forest on Mt Gorongosa in Mozambique, on quartzite and granite; 1700–2540 m.

CONSERVATION STATUS. Least Concern. Restricted in distribution but locally abundant in preferred habitats, which are at fairly high altitude, above the average level of human impact on the mountains in Zimbabwe and Mozambique.

NOTES. *Cineraria pulchra* is most easily recognised on a herbarium sheet by its leaf shape and venation, distinguished from *C. mazoensis* by the very prominent veins on the lower surface of the leaves, as well as the more extensively pinnatifid base of the lamina, which frequently runs along the petiole, as do the conspicuous auricles. It occurs in the eastern mountains of Zimbabwe at higher altitude than *C. mazoensis* and has a much more shrubby growth form

with many more capitula in a compact synflorescence, creating a glorious display of bright yellow heads (Fig. 13C), hence the name '*pulchra*', meaning beautiful. *C. pulchra* is also characterised by frequently rounded ray floret limbs and distinctly bracteate peduncles nearest the capitula. Trichomes on the leaves consist of 2–4 narrow basal cells and a long, multi-celled apical appendage (Fig. 3D).

Goldsmith 110/68 (COI, K, PRE) from Mt Peni in the Chimanimani mountains is a very glabrescent specimen and has glabrous cypselae, but otherwise appears to match *Cineraria pulchra*. Putative hybrids between *C. pulchra* and *C. deltoidea* occur in the Chimanimani region of Zimbabwe. *C. deltoidea* grows at lower altitudes (e.g. 1100–1600 m) at the base of cliffs and in the 'dwarf miombo woodland', while *C. pulchra* grows at higher altitude (1700–2450 m) in the Chimanimani region. Specimens with features intermediate between the two species were observed growing in disturbed ground at the side of the road leading from Cashel to Chimanimani. The leaves of these putative hybrids are not as deeply nor extensively lobed or dissected as in *C. pulchra*, yet have the raised venation on the ventral surface of the leaves and the very large toothed auricles and lateral pinnae characteristic of that species, while leaf shape and lobing more closely match *C. deltoidea*. Molecular markers are available to investigate this hypothesis (Cron 2005).

26. *Cineraria magnicephala* Cron sp. nov. affinis *C. pulchra* sed capitulis multo majoribus paucis, foliis lobatis dentatisque minoribus differt. Typus: Malawi: Northern Province, Mzimba Distr., E of Champira, rocky summit of Lwanjati Hill, 1830 m [6000'], 14 July 1975, *Pawek* 9875 (holotypus WAG!, isotypus K!).

Perennial suffrutex, to c. 0.5 m tall. *Stems* woody, branched, cobwebby, glabrescent. *Leaves* deltoid to deltoid-reniform, (3–)5–7-lobed, some with a pair of lateral pinnae; lamina (11–)20–44 × (14–)25–40 mm, cobwebby, glabrescent (green) above, thickly white tomentose below; apex acute to obtuse; margin coarsely dentate, revolute; base subcordate to cordate; petiole (9–)18–34 mm long, tomentose, slightly glabrescent, winged; auricles auriform, coarsely dentate. *Capitula* heterogamous, radiate, solitary or few to many (e.g. 28 per stem branch) capitula arranged in a lax corymbose cyme; peduncles 8–20 mm long (–70 mm when solitary), cobwebby, sparsely bracteate, bracts 10–15 mm long. *Involute* calyculate; phyllaries 12, 13 or 14 (–17), 5–6 mm long, thickly cobwebby, glabrescent; margins scarious. *Ray florets* 12 or 13 (–16), 9–10 mm long; limb 6–7 mm long, 4- or 5-veined. *Disc florets* c. 70; corolla 4.2–5.2 mm long. *Cypselae* obovate, somewhat

concave on inner surface, compressed with strong median rib on inner and outer surfaces, margined, blackish-brown with paler margins, (2.0–)2.5–2.8 mm long, ciliate and sparsely hairy on faces. *Pappus* 3.5–4.5 mm long. Figs 13D, 14A.

PHENOLOGY. Flowering in July.

DISTRIBUTION. Malawi: Northern Province, Mzimba Distr., E of Champira, Lwanjati Hill and near Chikangawa (Map 12).

KNOWN COLLECTIONS. MALAWI: Mzimba Distr., E of Champira, rocky summit Lwanjati Hill, 14 July 1975, *Pawek* 9875 (holotype WAG, isotype K); 4 miles SW of Chikangawa, 4 July 1977, *E. Phillips* 2587 (K).

HABITAT. Rocky summit of hill, amongst rocks; 1900–2030 m.

CONSERVATION STATUS. Data Deficient. An apparently very rare species, known only from two collections in the Mzimba Distr. in northern Malawi.

NOTES. *Cineraria magnicephala* is fairly similar to *C. pulchra* in leaf shape and venation, but has fewer and much larger capitula (Fig. 13D). These capitula consist of 12–17 involucre bracts, 12–16 rays and c. 70 disc florets as opposed to 8–12 involucre bracts, 8(–13) rays and 26–43 disc florets in *C. pulchra*. Its leaves are much less dentate than in *C. pulchra*, and the revolute margins seen on the leaves of the specimen with older branches [*Pawek* 9875 (K, WAG)] may be highly diagnostic.

This species is known only from two collections: *Pawek* 9875 (K, WAG), which appears to be a branch from a shrublet, as the stem is woody and c. 4 mm in diameter, with many capitula; and *Phillips* 2587 (K), comprising two smaller plants with roots and unbranched or very slightly branched woody stems, only 15–30 cm tall, with solitary or few capitula, but otherwise matching the former collection. The latter appear to be plants in their first year of growth, as opposed to the older plant represented by *Pawek* 9875 (K, WAG).

27. *Cineraria alchemilloides* DC. (1838: 307); Harv. (1865: 310); Goldblatt & Manning (2000: 312). Types: South Africa, Tulbagh/Worcester, Winterhoeksberg 305–1525 m [1000–5000'], Nov., *Ecklon* 1360 (lectotype designated here G-DC!, isolectotype S!); *ibidem*, Nov., *Ecklon* 845 (syntype G-DC!).

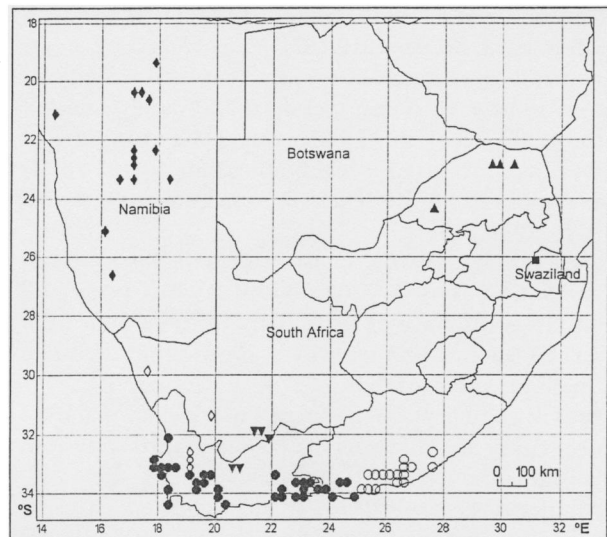
Perennial herb or shrublet, to 0.5 m (occasionally 1.0 m) tall. *Stems* woody towards the base, slender, lined, branching near the base, cobwebby, glabrescent to almost glabrous. *Leaves* reniform to deltoid-reniform (upper leaves more deltoid), distinctly 5–7-lobed, lobes sharply acute and dentate; lamina 8–26 × 11–32 mm, cobwebby, glabrescent above, thickly cobwebby to tomentose below, older leaves

sometimes glabrescent; apex acute; margin dentate; base truncate to slightly cordate (to cordate); petiole 8–52(–82) mm long, cobwebby; auricles small or conspicuous (rarely absent), sometimes caducous, varying from auriform to widening of base of petiole. *Capitula* heterogamous, radiate, few to many (6–43 per stem branch) arranged in a lax corymb; peduncles 3–19(–35) mm long, cobwebby, glabrescent, sparsely bracteate, bracts 1–3 mm long. *Involucre* with few calyculus bracts; phyllaries 7 or 8 (–10 in Namibian specimens; –13 in Brandberg specimens), 3.0–4.0 (–5.5) mm long, cobwebby, glabrescent or glabrous in Namibian subspecies; margins scarious. *Ray florets* 3–5 (–7 in Namibian subspecies, –8 in Brandberg specimens), 4.5–7.5 (–10) mm long; limb 2.0–5.0 (–7.0) mm long, 4-veined. *Disc florets* 9–13 (–20); corolla 3.7–5.5(–6.0) mm long. *Cypselae* obovate, compressed with prominent median rib, margined, dark brown to black when mature, brown with a paler margin when immature, 2–3 mm long, densely ciliate to ciliate, hairy or sparsely hairy to almost glabrous on faces. *Pappus* 4–5 mm long. Fig. 14B.

PHENOLOGY. Flowering September to November (rarely as early as August) in South Africa; in July and August, also in May and December in Namibia.

DISTRIBUTION. South Africa, Western Cape, in the Winterhoeksberge and Saron near Tulbagh and Kouebokkeveld near Worcester north to Calvinia in Namaqualand and possibly Kouberg near Springbok. Also in the mountainous regions of Namibia (Map 13).

HABITAT. Grows on steep slopes on rocky soil, below cliffs, usually in shade and sometimes in wet places,



Map 13. Known distribution of *Cineraria alchemilloides* subsp. *alchemilloides* (◇), *C. alchemilloides* subsp. *namibiensis* (◆), *C. lobata* subsp. *lobata* (●), *C. lobata* subsp. *platyptera* (○), *C. lobata* subsp. *lasiocaulis* (▼), *C. lobata* subsp. *soutpansbergensis* (▲) and *C. ngwenyensis* (■).

sandstone (often quartzitic sandstone) or on granite ledges below cliffs, below granite rocks, on schists or gneisses in Namibia; 800–1100 m in the Northern Cape and Western Cape; 1600–1750 m in Namibia.

CONSERVATION STATUS. Data Deficient for *Cineraria alchemilloides* subsp. *alchemilloides*. This subspecies is reportedly locally common where it occurs, but not widespread, with only a few collections known in South Africa. Least Concern for *C. alchemilloides* subsp. *namibiensis*. The Namibian subspecies is more widespread, also locally abundant or sometimes occasional in its occurrence.

NOTES. *Cineraria alchemilloides* is very closely allied to *C. lobata* subsp. *lobata* which occurs in the same area, but differs in its indumentum (cobwebby to tomentose vs. glabrous or sparsely hairy in *C. lobata* subsp. *lobata*). It also shows some affinity with *C. canecens* due to having similar trichomes, but is a

much more slender plant with capitula not as compactly arranged.

Only a few specimens from the Western and Northern Cape have been matched to *Cineraria alchemilloides* and they are not as thickly cobwebby as the types from the Worcester/Tulbagh area. Nevertheless, they are cobwebby to varying degrees and have the same type of trichome and small capitula. *Van der Schijff* 8088 (PRE) from the Kouberg is possibly an outlier of *C. alchemilloides* ssp. *namibiensis* in the Northern Cape in that it has glabrous peduncles and involucre bracts, but has very thinly cobwebby leaves.

Ecklon 1360 (G-DC) has been chosen as the lectotype as there is a duplicate at S. Both *Ecklon* 1360 and *Ecklon* 845 (G-DC) have old capitula that are not in good condition, but otherwise are good matches of the original description.

Key to subspecies of *Cineraria alchemilloides*

- Involucral bracts and peduncles cobwebby, glabrescent, from the Western Cape or Northern Cape subsp. **alchemilloides**
 subsp. **alchemilloides**
 Involucral bracts and peduncles glabrous, from Namibia subsp. **namibiensis**

Cineraria alchemilloides DC. subsp. **alchemilloides**

Leaves deltoid-reniform to reniform (upper leaves more deltoid), distinctly (5–)7-lobed, lobes sharply acute and dentate, lamina 8–26 × 11–32 mm, thinly cobwebby, glabrescent above, thickly cobwebby to tomentose below, older leaves sometimes glabrescent; apex acute; base truncate to subcordate; petiole 8–52 mm long, cobwebby. *Capitula* few to many (6–43 per stem branch) arranged in lax corymb. *Involucral bracts* (7–)8, 3–4 mm, cobwebby, glabrescent (tomentose in bud in some). *Ray florets* 3–5, 4.5–7.0 mm long; limb 2.0–5.0 mm long, 4-veined. *Disc florets* 9–13; corolla 3.7–5.5 mm long. *Cypselae* obovate, compressed with prominent median rib on outer face, margined, dark brown to black when mature, brown with a paler margin when immature, 2.5–3.0 mm long, densely ciliate to ciliate, sparsely hairy to almost glabrous on faces.

PHENOLOGY. Flowering September to November (rarely as early as August).

HABITAT. Steep slopes, below cliffs, usually in shade and sometimes in wet places, rocky soil and on sandstone (often quartzitic sandstone); 800–1100 m.

SELECTED COLLECTIONS. SOUTH AFRICA: Northern Cape: Calvinia, Ekerdam, 27 Sept. 1947, *Taylor* 2813 (NBG); Calvinia, Hantams Mts, 19 Dec. 1963, *Nordenstam* 3542 (S); Foothills of Kouebokkeveld, 26 Sept. 1911,

Stephens 7005 (BOL); Western Cape: Porterville, Dasklip Pass, 7 Oct. 1981, *Mauve & Hugo* 36 (K, PRE, WAG, US); Tulbagh, Winterhoeksberg, Nov., *Ecklon* 1360 (lectotype G-DC, isolectotype S); *ibidem*, Nov., *Ecklon* 845 (syntype G-DC); Farm 'de Hoop', Saron near Tulbagh, 18 Sept. 1980, *Schonken* 327 (PRE).

Cineraria alchemilloides DC. subsp. **namibiensis** *Cron* subsp. **nov.** a subsp. *alchemilloide* involucris bracteis glabris, foliis majoribus plerumque plus tomentosis differt. Typus: Namibia, Windhoek, 10 July 1954, *Schelpé* 155 (holotypus BOL!; isotypi BM!, K!, US!).

Senecio momordicifolius Dinter & Muschl. in Dinter (1926: 232) *synon. fide* Merxm. (1967: 41). Type: Windhoek, 1600 m, July 1909, *Dinter* 1001 (holotype K!).

Leaves deltoid-reniform to reniform, occasionally with lateral pinnae, distinctly to shallowly lobed; lamina 16–60 × 21–84 mm, cobwebby, glabrescent to varying degrees above, tomentose to thickly cobwebby below; apex acute to obtuse; base truncate to subcordate or frequently cordate; petiole 15–82 mm long, thickly cobwebby to tomentose. *Capitula* few (8–16) to many (18–32) capitula in a lax or compact corymbose panicle. *Involucral bracts* 8(–10) (–13 in Brandberg specimens), 4.0(–5.5) mm long, glabrous. *Ray florets* (3–)5(–7) or to 8 in Brandberg specimens,

5.0 – 7.5(– 10) mm long; limb 3.0 – 5.0(– 7.0) mm long, 4(– 5)-veined. *Disc florets* 12 – 20(– 32 in Brandberg specimens); corolla 3.8 – 5.0(– 6.0) mm long. *Cypselae* obovate (oblong when younger), with prominent inner rib when mature, compressed, margined, dark brown to black with white hairs, 2.0 – 3.0 mm long, ciliate and hairy (occasionally sparsely hairy) on faces.

PHENOLOGY. Flowering December to March.

HABITAT. Grows on granite in cracks and below large rocks.

KNOWN COLLECTIONS. NAMIBIA: Tsumeb, 27 May 1954, *Brain* P8 (PRE); Otjiwarongo, Waterberg, 14 July 1954, *Schelpe* 189 (BM, BOL); Otjiwarongo, Waterberg, Farm Hohensee (Otjahevita), 24 May 1968, *Meyer* 1176 (BR, WAG); Waterberg Plateau, Dec. 1935, *Boss* s.n. sub TM 34973 (PRE); Waterberg, 4 Aug. 1919, *Pole Evans* H19316 (PRE); *ibidem*, *Pole Evans* H19320 (PRE); Waterberg, Farm Onjoka, 20 July 1972, *Giess* 12353 (PRE); Omaruru Distr., Brandberg, below Königstein Peak, 27 March 1986, *Craven* 2456 (PRE); Brandberg, Numasplato, 7 Dec. 1969, *Oliver* s.n. sub PRE 51887 (PRE); Brandberg, Upper Numas valley, *Wiss* 1438 (PRE); Brandberg, Orabeswand, 4 April 1964, *Nordenstam* 3659 (S); 10 miles NE of Windhoek, 23 July 1949, *Steyn* 177 (NBG); Nossob in Orumbo, Hereroland, *Dinter & Schinz* 1269 (BM); Windhoek, 10 July 1954, *Schelpe* 155 (holotype BOL, isotypes BM, K, US); Windhoek, 1600 m, July 1909, *Dinter* 1001 (K); Windhoek, Erosgebirges, Aug. 1963, *Merxmüller & Giess* 3558 (BR, PRE); Windhoek, Farm Regenstein, 30 April 1972, *Giess* 11789 (PRE); Grossherzog, Friedrichsberg, Farm Regenstein, 22 Aug. 1972, *Merxmüller & Giess* 28029 (WAG); Windhoek, Farm Golschau, 15 July 1965, *Leach, Bayliss & Giess* 12944A (PRE, S); 26 miles S of Windhoek, 21 July 1954, *Schelpe* 206 (BM, BOL); Windhoek Distr., Klein Windhoek, 26 May 1958, *Giess* 1976 (PRE); Rehoboth Distr., Farm Hohenheim 24, E of Gamsberg, *Kers* 166 (S); Farm Göllschau, 26 July 1974, *Giess* 13574 (K); W of Rehoboth, 16 July 1965, *Giess* 9815 (PRE); Maltehöhe Distr., Nubib Mt, Farm Erfstuk, Witrif, 20 Dec. 1995, *Winter* 284 (J); Namaland, Gubab, *Dinter & Schinz* 1202 (BM); Kububberge, 21 Aug. 1963, *Merxmüller & Giess* 3023 (PRE). **SOUTH AFRICA:** Northern Cape: Kouberg, 14 Aug. 1967, *Van der Schijff* 8088 (PRE).

NOTES. Specimens from Namibia, here named as *Cineraria alchemilloides* subsp. *namibiensis*, were previously identified as *C. canescens* by many taxonomists, including Merxmüller (1967). However, they have the deltoid to deltoid-reniform leaf shape and lobing with sharply acute teeth more typical of *C. alchemilloides* and the size and laxness of their capitula also better match *C. alchemilloides*. These plants grow on granite, which is similar to *C.*

canescens, but lack the dissection of the lobes (into three) seen in the leaves of *C. canescens*, which also tend to have a more rounded-reniform outline. They differ from *C. alchemilloides* subsp. *alchemilloides* by having glabrous involucre bracts and larger capitula, and also larger leaves, usually more tomentose than in the subspecies from the Northern and Western Cape. There is a different trichome complement in some specimens (with broader tapering basal cells and a long apical appendage on the ventral surface).

Specimens from the Brandberg, an extinct volcano in northwestern Namibia, collected from between 1900 and 2572 m, are extremely glabrescent, with only the youngest leaves being cobwebby or tomentose. Their capitula are larger than usual in *C. alchemilloides* var. *namibiensis* with 7 or more commonly 8 rays, 26 – 32 disc florets and 10 – 13 involucre bracts and as opposed to the (3 –) 5 (– 7) rays, 12 – 20 disc florets and 8 (– 10) involucre bracts present in the other Namibian specimens. Nevertheless, they are not considered to be a distinct taxon, although the Brandberg is an isolated massif and has at least eight endemic plants amongst the 480 recorded vascular plants (Craven & Craven 2000; Van Jaarsveld & Voigt 2004).

28. *Cineraria lobata* L'Hér. (1788: 26); Aiton (1789: 221); Thunb. (1800: 155); Willd. (1803: 2078); J. F. Gmel. (1796: 1239); W. T. Aiton (1813: 73); Thunb. (1823: 671); DC. (1838: 307); Harv. (1865: 311); Goldblatt & Manning (2000: 312). Types: South Africa, Cape of Good Hope, March – April 1771, *Banks & Solander* (lectotype designated here BM!); Prom. bon. Cap., *Masson* s.n. (syntype BM!).

Perennial herbs or subshrubs, to about 0.6 m tall. *Stems* woody towards the base, usually slender, 2.0 – 4.0(– 5.0) mm in diameter, branching mainly near the base, usually glabrous, occasionally sparsely hairy, but densely hairy or cobwebby, glabrescent in some forms. *Leaves* deltoid-reniform to reniform, distinctly (rarely shallowly) 5 – 7-lobed, sometimes with one or two pairs of lateral pinnae on upper leaves; lamina 6 – 58 × 8 – 64 mm, glabrous, rarely sparsely hairy on veins below and at junction with petiole, very hairy in some forms, thinly cobwebby, glabrescent in others; apex obtuse to rounded (rarely acute); margin dentate; base truncate to subcordate to cordate; petiole 6 – 72(– 87) mm long, glabrous or sparsely hairy (hairy in some forms, cobwebby glabrescent in some northern specimens), with white woolly hairs in axils; auricles present, small or conspicuous, persistent or caducous, auriform in the Western Cape and Eastern Cape, lanceolate in the northern subspecies. *Capitula* heterogamous, radiate, few (2 –

12) to many (14–90) per stem branch (rarely as many as 120), usually small, arranged in a lax panicle (rarely compact); peduncles 2–55 (–65) mm long, glabrous (or hairy in some forms, cobwebby, glabrescent in some northern specimens), bracteate. *Involucre* with few calyculus bracts, often descending peduncle; phyllaries (5–)8–10(–13), 3–5(–6) mm long, glabrous (or hairy in some south-western Cape forms); margins scarious. *Ray florets* (3–)5(–8, rarely 9), 3.5–7.5(–12.5) mm long; limb 3.0–6.0(–9.5) mm, 4-veined (rarely 6-veined). *Disc florets* (7–)16–28(–43); corolla 3.0–5.0 mm long. *Cypselae* obovate (to narrowly obovate in *C. lobata* subsp. *lasiocaulis*), laterally compressed, margined to narrow-winged, ray cypselae with broad wings in Eastern Cape forms, brown or dark brown (to black) with paler margin or wing, 2.0–4.0 mm long, ciliate and hairy to sparsely hairy on faces, inner faces often less hairy than outer, some almost glabrous. *Pappus* of scabrid bristles, usually two thirds of disc corolla length. Figs 14C, 15.

PHENOLOGY. Flowering August to January in the winter rainfall region, May to July in the summer rainfall region, but also October, November and December on misty mountain tops or near lakes.

ILLUSTRATION. Redouté in L'Hér. (1792: t. 34).

DISTRIBUTION. South Africa, from Saldanha Bay to the Cape Peninsula in the Western Cape, in the mountains of the interior of the Western and southern Cape to Port Elizabeth and Grahamstown in the Eastern Cape, the Layton area in the Northern Cape; a disjunct population also occurs in the Soutpansberg and Blouberg Mountains in Limpopo Province, also collected in the Kransberg and on the mountain between the Drakensberg range and Legalameetse (Map 13).

HABITAT. Grows mainly on the southern slopes of rocky mountains, hills or ridges, growing in the shade of boulders, ledges or bushes, or in shady kloofs or rock crevices or at the base of cliffs, occasionally in river beds or next to mountain streams. Recorded growing on sandstone outcrops, on granite koppies or amongst granite rocks, at an altitude of 10–50 m near seashore and at 150 m on the Cape Peninsula, but generally from 500–1800 m inland, 1140–1560 m in the Soutpansberg and 1425–1600 m in the Blouberg.

CONSERVATION STATUS. Least Concern. A fairly widespread species, more common in the Eastern Cape and southern parts of the Western Cape (in the correct habitats), less frequent in the northern part of the Western Cape, Northern Cape and Limpopo Province. All four subspecies are also considered to be Least Concern, including *Cineraria lobata* subsp. *lasiocaulis*, which, though limited in occurrence, is found in a fairly pristine habitat type.

NOTES. Across its range, *Cineraria lobata* varies in size and number of capitula, presence and type of

indumentum, robustness of the stems, size and shape of the auricles, as well as shape, colour and degree of indumentum of its cypselae. It is characterised by its distinctly lobed leaves, generally small capitula with 5 or 6 (rarely 8 rays), and ciliate and/or hairy cypselae. Its stem and leaves are usually glabrous or sparsely hairy, although a few populations in the Western Cape are densely hairy, and some of the more northerly populations in the Karoo and Limpopo Province are cobwebby. There appears to be a trend from west to east in terms of increasing size of the capitula in *C. lobata*, and also increased width of the cypselae margin or wing.

A detailed multivariate study was undertaken on the morphological variability seen in *Cineraria lobata* (Cron 2005), resulting in the recognition of four morphologically distinct subspecies: *C. lobata* subsp. *lobata* (from the Western and Eastern Cape), *C. lobata* subsp. *lasiocaulis* from the Karoo, *C. lobata* subsp. *platyptera* from the Eastern Cape and *C. lobata* subsp. *soutpansbergensis* from the Soutpansberg region. In addition, five forms within *C. lobata* subsp. *lobata* from the Western Cape are informally recognised.

Two varieties previously recognised for *Cineraria lobata*: *C. lobata* var. *gracillima* DC. and *C. lobata* var. *pappei* Harv. are not retained in this revision. *C. lobata* var. *gracillima*, from the Uitenhage Distr. in the Eastern Cape, described as being simple, erect and slender with a weak fibrous root system, is most likely simply flowering in its first year of growth, as noted by de Candolle (1838: 308). *C. lobata* var. *pappei*, with very many small heads and based on a specimen collected by Dr Pappé from the Winterhoek mountains, Tulbagh, has been included in form 1 of *C. lobata* subsp. *lobata*.

Cineraria lobata was first described by L'Héritier (1788) based on Banks & Solander and Masson specimens from 'Prom. Bonae Spei'. The Banks & Solander specimen is selected as the lectotype as the Masson specimen is in poor condition. It was collected at the Cape of Good Hope on the first voyage of Captain Cook (HMS Endeavour) during the period 14 March–14 April 1771, probably not very far from Cape Town.

Cineraria lobata has been distinguished from *C. geifolia* by being glabrous in all parts, with many more, but smaller capitula, with 6 or 7 involucre bracts (not 12 or 13) and a more branching inflorescence (de Candolle 1838; Harvey 1865). Many of these features are however quite variable in *C. lobata*, especially the presence and type of indumentum on the leaves and stem. Nevertheless, *C. lobata* usually has more distinctly lobed leaves, either glabrous or sparsely hairy in the Western Cape, and its trichomes differ from *C. geifolia*, being narrower and longer, commonly with an apical appendage in the hairy form. *C. lobata* generally has more slender stems than

C. geifolia, although the form of *C. lobata* subsp. *lobata* from the Cape Peninsula and near Saldanha Bay is more robust than usual and may have slightly larger capitula with 7 or 8 rays (instead of 5), and occasionally more than 8 involucre bracts (9–12). In this region, it is sometimes difficult to distinguish from *C. geifolia*, and it is possible that the two species are hybridising on the Cape Peninsula, where *C. lobata* grows close to sea level.

Cineraria lobata also resembles *C. saxifraga* from the Eastern Cape, but the leaves of *C. saxifraga* are slightly

succulent, smaller, more shallowly lobed with distinctly cuneate to truncate bases and are exauriculate. In the Eastern Cape, *C. lobata* subsp. *platyptera* may be confused with *C. erodioides*, but the trichomes and auricles of that species differ from *C. lobata*.

Cineraria lobata is listed in the *Catalogue of Problematic Plants in southern Africa* as being competitive with preferred vegetation (Wells *et al.* 1986), although it is not apparent where this problem has been observed and if the species was correctly identified.

Key to the subspecies of *Cineraria lobata*

- 1a. Auricles lanceolate, small; upper leaves deltoid to deltoid-reniform 28d. *C. lobata* subsp. *soutpansbergensis*
 1b. Auricles auriform, small to large; upper leaves deltoid-reniform or reniform 2
 2a. Mature cypselae obovate (twice as long as broad), dark or paler brown, margined or distinctly broadly winged; capitula with 3–5 (rarely 6) rays and 8 (–13) involucre bracts; leaves and stem glabrous or hairy (not cobwebby) 3
 2b. Mature cypselae narrowly obovate (three times as long as broad), black or dark brown with white hairs densely covering outer faces, not winged, glabrous or sparsely hairy inner faces; capitula with 8 or more rays and 12 or 13 involucre bracts; base of leaves and petioles cobwebby, glabrescent, thick woolly tufts in nodes extending to cover stem 28c. *C. lobata* subsp. *lasiocaulis*
 3a. Ray cypselae margined or narrowly winged; auricles small or conspicuous, not procurvent 28a. *C. lobata* subsp. *lobata*
 3b. Ray cypselae broadly winged, fringed with hairs; auricles usually conspicuous, often procurvent 28b. *C. lobata* subsp. *platyptera*

28a. *Cineraria lobata* L'Hér. subsp. *lobata*

Stems glabrous, sparsely hairy, occasionally densely hairy (not cobwebby), usually slender, occasionally more robust, 2–4.5 mm in diameter, rigid, lined. *Leaves* reniform, distinctly- (to rarely shallowly-) lobed, infrequently with lateral pinnae, 8–48 × 11–67 mm, glabrous above (rarely hairy), glabrous or sparsely or rarely densely hairy below, especially on veins and at base of lamina, trichomes multi-celled with tapering base and apical appendage; petiole 6–72 mm long, glabrous or sparsely hairy, thickly cobwebby axils and buds, auricles vary from tiny (or absent) to large, auriform. *Capitula* small to medium, few (4–12) to many (c. 100) on fairly short peduncles (2–28 mm long). *Involucre bracts* (5–)8 (rarely 10–13), 3–4 (–5) mm long, glabrous (rarely hairy), calyculate. *Rays* (3–)5(–8), 5–10.5 mm long. *Disc florets* 7–26; corolla 3–5 mm long. *Cypselae* obovate, ciliate and hairy or sparsely hairy on faces, brown, margined or narrow-winged, 2.0–3.2 mm long when mature.

PHENOLOGY. Flowering August to January in the winter rainfall areas, May to July in the Eastern Cape region.

DISTRIBUTION. Western Cape, extending into the Eastern Cape in the Humansdorp region.

(i) **Small-headed form** from the Western Cape (including var. *pappei* Harvey 1865) (Fig. 15B). *Stems* glabrous, slender (2–3.5 mm in diameter), rigid, lined. *Leaves* distinctly lobed. *Few to many small capitula*, fairly laxly arranged on glabrous peduncles 5–30 mm long. *Involucre bracts* 5–8, 3.0–4.0 mm long, glabrous, rays 3–5, 4.5–6.5 mm long, disc florets 8–18. *Cypselae* ciliate and hairy, margined.

COLLECTIONS EXAMINED. SOUTH AFRICA: Western Cape: Between Witelskloof and Lambertshoekberg, Oct. 1939, *Pillans* 9158 (BOL); Piquetberg, Versveld Pass, Nov. 1994, *Watson & Panero* 94-30 (NBG); Piquetberg, De Hoek, 28 Sept. 1943, *Compton* 14993 (NBG); Clanwilliam Division, about 2 miles up the Hex R. Valley, *Pillans* 9130 (BOL); Malmesbury Division, near Hopefield, Oct. 1887, *Bachmann* 2223 (Z); Oshoekkop N of Moorreesburg, 17 Sept. 1982, *Van Zyl* 3305 (WAG); Neulfontein se berg, S of Moorreesburg, 17 Sept. 1982, *Van Zyl* 3269 (K); Winterhoek Mt, Tulbagh, Nov., *Zeyher* s.n. sub SAM 16977 (SAM); Western foot of Vogelvllei Mts, near

Gouda, Sept. 1951, *Esterhuysen* 18837 (PRE); Tulbagh, New Kloof, 18 Oct. 1941, *Compton* 12048 (NBG); Tulbagh, Jan. 1887, *Marloth* 1653 (PRE); near Ceres, *Bolus* 8375 (BOL); Du Toit's Kloof, Waaihoek Mts, 21 Jan. 1949, *Esterhuysen* 15075 (BOL, GRA, NBG, PRE); Karoo Garden, 6 Dec. 1948, *Compton* 21201 (NBG); *ibidem*, 27 Oct. 1975, *Dobay* 85 (NBG); *ibidem*, 26 Aug. 1976, *Bayer* 226 (NBG); Worcester, Veld Reserve, Oct. 1962, *Olivier* 174 (K, PRE); *ibidem*, April 1948, *Van Breda* 59 (PRE); Hex River Mts, Mt Brodie, *Esterhuysen* 8440 (BOL); near De Doorns, *Bolus* s.n. (BOL); Cape of Good Hope, March – April 1771, *Banks & Solander* (lectotype BM); *ibidem*, *Masson* s.n. (syntype BM).

(ii) **Hairy form** mainly from the Worcester and Montagu regions in the Western Cape, also from the Cederberg. *Stems and leaves very hairy*, otherwise habit similar to form described above. Trichomes comprise a tapering multi-celled base with long apical appendage (Fig. 3C2). Few capitula, peduncles hairy. Involucral bracts 7 or 8, hairy; rays 4 or 5 (rarely 6). Ray cypselae margined or distinctly winged, ciliate, sparsely hairy or hairy on outer faces, almost glabrous on inner faces; disc cypselae margined or narrow-winged, ciliate, hairy, mature cypselae 3 – 4 mm long.

COLLECTIONS EXAMINED. SOUTH AFRICA: Western Cape: Cederberg, Wolfberg, 15 Dec. 1950, *Esterhuysen* 18108 (BOL); Hex River Mts, Kleinberg, Nov. 1943, *Esterhuysen* 9946 (BOL); between Montagu and Triangle, Oct. 1922, *Michell* 113 (PRE); Montagu, Donkerkloof, 1 Feb. 1996, *Cron & Perrett* 333 (B, J, LISC, M); *ibidem*, Sept. 1946, *M. R. Levyns* 8054 (BOL); *ibidem*, Sept. 1946, *Compton* 18464 (NBG); Montagu, Baden Kloof, 31 Jan. 1996, *Cron & Perrett* 331 (CM, J); *ibidem*, Sept. 1946, *Lewis* 2108 (SAM); Cogmans Kloof, *Bolus* 113 (BOL); Swellendam Distr., Storms Vlei Kloof, 24 Sept. 1941, *Compton* 11858 (NBG); Bredasdorp, Kathoek, *Acocks* 22751 (PRE).

(iii) **Robust form** from Saldanha Bay to the Cape Peninsula in the Western Cape. A more *robust growth form*, stems 4 – 5 mm in diameter, glabrous. Leaves reniform, auricles usually conspicuous. Capitula many, larger than in other forms. Involucral bracts 8 – 13, rays 5 – 8, disc florets 26 – 36. Cypselae with paler narrow wing (rarely margined), ciliate, hairy or sparsely hairy on faces, 2.0 – 3.8 mm long.

COLLECTIONS EXAMINED. SOUTH AFRICA: Western Cape: Limestone hilltops above Saldanha, 17 Sept. 1976, *Goldblatt* 4107 (MO, PRE, WAG); Saldanha, 6 Oct. 1981, *Hugo* 2927 (PRE, WAG); Saldanha Bay, Hoetjies Bay, Sept. 1905, *Bolus* 12722 (BOL); Malmesbury between Groenkloof and Saldanha Bay, Sept., Oct. 1839, *Drège* s.n. sub PRE 12804; NE of Langebaan, *Pillans* 6990 (BOL); Malmesbury Distr., Yzerfontein,

Dokter se klip, 12 Oct. 1978, *Boucher* 4005 (K, PRE, WAG); slopes of Lion's Head, Oct. 1897, *Froembling* 31 (NBG); Cape Point, 24 Jan. 1996, *Cron & Hodgkiss* 317 (J).

(iv) **Small-leaved, jointed stem form** from the vicinity of Uniondale and Humansdorp in the Western Cape, extending slightly into the Eastern Cape. Characteristically *small shrublets with branching woody stems, short internodes* creating a jointed appearance. *Leaves small*, some with lateral pinnae, glabrous. Capitula few, laxly arranged. Involucral bracts 8(–10), (3.5–)4–6 mm long; rays 5 (rarely 8). *Cypselae distinctly winged* (ray cypselae occasionally fairly broad-winged).

COLLECTIONS EXAMINED. With narrow-winged cypselae. SOUTH AFRICA: Western Cape: Uniondale Division, Mannetjieberg, 3 Nov. 1941, *Esterhuysen* 6497 (BOL, PRE); 3 miles S of Uniondale, 18 July 1937, *Salter* 6728 (K); S of Avontuur, May 1921, *Fourcade* 1302 (BOL, GRA, K); Uniondale, Hoopsberg, 12 March 1966, *Rourke* 392 (NBG); Prince Alfred Pass, 15 Dec. 1937, *Wall* s.n. (S); Uniondale, Louterwater, 30 April 1935, *Compton* 5215 (BOL, NBG); Uniondale Division, De Hoek at foot of Outeniqua, near Joubertina, 18 Nov. 1944, *Esterhuysen* 10675 (BOL); N of Joubertina, foothills of Kouga Mts, 3 Dec. 1999, *Cron & Goodman* 569 (B, E, J, K, MO). Kouga near Misgund, 13 Oct. 1938, *Compton* 7879 (NBG); Eastern Cape: Humansdorp, Cambria, 13 April 1952, *Compton* 23425 (NBG); Willowmore-Patensie Pass, c. 12 miles W of Cambria, 28 April 1947, *Story* 2446 (PRE, UPS).

With broad-winged ray cypselae: Western Cape: Hoopsberg, *Esterhuysen* 6581 (BOL); Uniondale, Helpmekaar, 28 Jan. 1941, *Compton* 10516 (NBG); Nature's Valley, Formosa Peak, 11 Aug. 1985, *de Lange* s.n. sub PRE 9406/11 (PRE); Formosa, Louterwater, Jan. 1940, *Thorne* s.n. sub SAM 54759 (SAM); Tsitsikama Mts near Joubertina, *Esterhuysen* 16860 (PRE); rocky hill N of Joubertina, Aug. 1923, *Fourcade* 2677 (BOL).

(v) **Compactly many-headed form** from the southern region of the Western Cape (Fig. 15A). *Spreading suffrutex*. Stems robust. Leaves reniform to deltoid-reniform or rounded-reniform, mostly shallowly lobed, (13–)18–46 × (18–)26–56 mm, glabrous to sparsely hairy or hairy above, sparsely to densely hairy below, trichomes eglandular, multi-celled, usually with an apical appendage; petioles relatively long (11–87 mm long); auricles small or large. *Capitula small, very many* 38–90(–120), *compactly arranged on short peduncles* 2–8(–12) mm long. Involucral bracts 8, 3–4 mm long, rays commonly 4 or 5 (rarely 3 or 6), disc florets 12–14(–17); corolla 3–3.5 mm long. Cypselae narrow-winged or

margined, brown or black with a paler margin, ciliate with hairy to sparsely hairy outer faces, inner faces sparsely hairy to glabrous, 1.8 – 2.5 mm long.

COLLECTONS EXAMINED. Western Cape: George, Kainan's Gat, 13 Oct. 1947, *Prior* s.n. (K); Herolds Bay, 28 Sept. 1967, *Marsh* 592 (K, PRE); Knysna Distr., Goukamma, 1 Oct. 1939, *Compton* 7558 (BOL); Goukamma Pass, 23 Nov. 1944, *Fourcade* 6521 (BOL); Knysna, Brenton-on-Sea, 19 Dec. 1996, *Lubke, Victor & Hoare* 6 (PRE); Eersterivier, 3 Dec. 1999, *Cron & Goodman* 568 (E, J, K, MO); Witelsbos, Oct. 1920, *Fourcade* 955 (BOL, GRA).

NOTES. The first and last forms described above both have many small capitula, but differ markedly in their habit and compactness of capitula (i.e. peduncle length). The compact, many-headed form grows as a spreading bush covering rocks along the seashore or scrambling on south facing slopes near the sea, with fairly robust stems. It is a coastal form growing near Mossel Bay, George, Knysna and at Eersterivier. In contrast, the many-headed form from more inland mountains in the Western Cape is a herb or small suffrutex, with more laxly arranged capitula, generally on longer peduncles.

28b. *Cineraria lobata* L'Hér. subsp. *platyptera* Cron subsp. nov. a subsp. *lobata* cypselis floscolorum radiorum alis latis, floscolorum discorum alis angustis vel latis differt. Typus: South Africa, Eastern Cape, Kommadagga, 460 m [1500'], 12 Aug. 1963, *Bayliss BS* 1606 (holotypus PRE!; isotypi GRA!, K!, MO!, NBG!, Z!).

Stems glabrous, slender, branching mainly from the base. *Leaves* reniform, distinctly or shallowly lobed, rarely with 1 or 2 pairs of lateral pinnae; auricles conspicuous and often run up petiole. *Capitula* small to medium, involucre bracts 8 – 13, 3 – 4 mm long, glabrous; rays commonly 5 (rarely 4 or 6), disc florets 26 – 28; corolla 3 – 4 mm long. *Cypselae* ciliate, hairy to sparsely hairy on outer faces, sparsely hairy on inner faces, ray cypselae broad-winged, disc cypselae narrow- (to broad-) winged.

PHENOLOGY. Flowering mainly August to January, also in May, June and July.

DISTRIBUTION. Eastern Cape: in the Distrs of Albany, Uitenhage and Port Elizabeth.

SELECTED COLLECTIONS. SOUTH AFRICA: Eastern Cape: Koonap, *Blackbeard* sub NBG 860/14 (BOL); Komga, along Kabousie R., Jan. 1890, *Flanaghan* 495 (GRA); 3 miles E of Willowmore, *Bayliss* 4920 (MO, NBG); Addo Elephant Park, Rest Camp, 12 Oct. 1976, *Botha* 6543 (GRA); Addo Elephant Park, Zuurkop, 28 Jan. 1966, *Liebenberg* 7729 (K, PRE); Alexandria

Distr., 10 Oct. 1952, *Archibald* 4546 (GRA); Springs Nature Reserve, Uitenhage, 28 Jan. 1978, *Olivier* 1985 (GRA, WAG); *ibidem*, 18 Oct. 1979, *Olivier* 2645 (WAG); Despatch, June 1914, *Holland* 429 (GRA); Uitenhage Distr., Hellsgate Kloof, 13 Sept. 1930, *Fries, Norlindh & Weimarck* 988 (US, WAG); Addo National Park, 18 Oct. 1951, *Archibald* 3777 (GRA, PRE); Addo National Park, Rhino Camp, 10 May 1976, *Hall-Martin* 6660 (PRE); Kommadagga, 12 Aug. 1963, *Bayliss BS* 1606 (holotype PRE; isotypes GRA, K, MO, NBG, Z); Alexandria, Nanaga, 24 May 1954, *Johnson* 947 (PRE); Redhouse, Aug. 1908, *Mrs T. V. Paterson* 72 (BOL, GRA); Port Elizabeth, Markman Industrial area, 23 Oct. 1974, *Dahlstrand* 3151 (K); Alicedale, 1 Aug. 1918, *Cruden* 277 (GRA); Cradock road, 7.7 miles from Grahamstown, *Booi* 43 (GRA, K, PRE); Fish R. Valley, between Grahamstown and Fort Beaufort, c. 40 km N of Grahamstown, 19 Oct. 1986, *Phillipson* 1506 (GRA, K, MO, NBG, PRE, UPS); Pluto's Vale, 12 Oct. 1978, *Bayliss BS* 8878 (WAG); 14 miles from Grahamstown on Fort Beaufort Road, 24 Aug. 1954, *Marais* 427 (K, PRE); Old Quarry, Grahamstown, 17 June 1976, *Bayliss BS* 7511 (MO, WAG, Z); Alexandria, Farm Kaba, Dec. 1953, *Johnson* 846 (PRE); Alexandria, Bushman's Riverpoort, Payne's farm, 31 Aug. 1954, *Johnson* 1029 (K, PRE, UPS); Kariega Mouth, 25 July 1954, *Warren* A1675 (GRA); near Jeffrey's Bay, July 1927, *Duthie* 1090 (BOL); Van Staden's Pass, *Maguire* 564 (NBG); Van Staden's Nature Reserve, *Wells* 3369a (GRA); Farm Brooklands, Albany district, *Bayliss BS* 4281 (NBG, Z).

28c. *Cineraria lobata* L'Hér. subsp. *lasiocaulis* Cron subsp. nov. a subsp. *lobata* caulis internodiis abbreviatis caespitibus lanatis albis, capitulis majoribus, et cypselis anguste obovatis faciebus exterioribus pilis brevis albis, faciebus interioribus cypselarum radiorum fere glabris discorumque pilis paucis differt. Typus: South Africa, Western Cape, Laingsburg Distr., Whitehill Ridge, S side, Oct. 1929, *Compton* 3601 (holotypus BOL!; isotypus K).

Tufted herb. *Stems* cobwebby, glabrescent with woolly axils, short internodes. *Capitula* few (2 – 6 per stem branch), laxly arranged; peduncles 20 – 75 mm long. *Involucre bracts* 12 or 13; 5 – 6 mm long. *Rays* 7 – 9, 6.5 – 10.2 mm long. *Cypselae* narrowly obovate, slightly margined, black (or dark brown), outer face densely covered with short white hairs, inner faces of ray cypselae almost glabrous, inner faces of the disc floret cypselae less hairy than outer surface, inner median rib sometimes evident on mature cypselae.

PHENOLOGY. Flowering August to October.

DISTRIBUTION. South Africa: in the Laingsburg area of the Little Karoo (Western Cape) and in the vicinity of Layton in the Great Karoo (Northern Cape).

COLLECTIONS EXAMINED. SOUTH AFRICA: Northern Cape: 10 miles W by S of Fraserburg, *Acocks* 16895 (K, PRE); Fraserburg, Layton, Rooiwal Mill, 8 Aug. 1965, *Shearing* 57 (PRE); Beaufort West Distr., Layton, Hoendervoet, 23 Sept. 1986, *Shearing* 1332 (PRE); Laingsburg Distr., Whitehill Ridge, 30 Oct. 1920, *Compton* 3601 (holotype BOL, isotype K); *ibidem*, Aug. 1941, *Compton* 11241 (NBG); *ibidem*, 20 Sept. 1943, *Compton* 14913 (NBG, PRE); NW of Matjiesfontein, Oct. 1950, *Hall* 172 (NBG); Ngaap Kop, Laingsburg, 2 Sept. 1940, *Compton* 9280 (NBG).

28d. *Cineraria lobata* L'Hér. subsp. *soutpansbergensis* Cron subsp. nov. a subsp. *lobata* foliis superis deltoideis (non reniformibus) et auriculis lanceolatis non auriformis differt. Typus: South Africa, Limpopo Province, Soutpansberg, roadside on Farm Punchbowl, 1140 m, 12 May 1994, *Cron, Balkwill & Balkwill* 282 (holotypus J!; isotypi B!, K!, MO!, PRE!, S!). (Fig. 15C).

Perennial herb or subshrublet. *Stems* glabrous or cobwebby, glabrescent, slender (2–4 mm in diam. at base), woody and branching near the base. *Upper leaves* deltoid to deltoid-reniform, distinctly and sharply 5-lobed, sometimes with one or two lateral pinnae, lower leaves deltoid-reniform to reniform, thinly cobwebby to glabrous above and cobwebby to glabrous below, young leaves sometimes thickly cobwebby, fine trichomes, thick cobwebby axils and buds; auricles small, lanceolate, caducous. *Capitula* small to medium, few (4–8) to many (12–42) per stem, on short peduncles (4–32 mm long). *Involucral bracts* 8–12(–13), (3.5–)4–5 mm long, glabrous; rays 5–8 (rarely 9), 6–11.5 mm long; limb 3.5–9 mm long; (18–)22–30 disc florets; corolla 4–5 mm long. *Cypselae* dark brown, margined, ciliate and hairy to sparsely hairy (rarely with glabrous faces), 2.2–3.0 mm long when mature.

PHENOLOGY. Flowering March to early July, but mainly in May. There is a single collection dated October (*Codd & Dyer* 18049) from Lake Fundudzi in Venda, Limpopo Province. Cobwebby form also flowers in November and December near mountain tops.

DISTRIBUTION. South Africa: mainly in the Soutpansberg Centre of Endemism: Soutpansberg and Blouberg Mts and near Lake Fundudzi, Limpopo Province. Also near Lobyana in the Drakensberg range between Strydom Tunnel and Legalameetse (previously The Downs). A collection from Thabazimbi, Kransberg is also a fair match.

SELECTED COLLECTIONS. SOUTH AFRICA: Limpopo Province: Farm Surprise 267 MS, Soutpansberg, 17

June 1982 *Fourie* 186 (PRE); Soutpansberg, Farm Zwarthoek, 1 May 1995, *Balkwill & Balkwill* 9318 (J); *ibidem*, 13 May 1994, *Cron, Balkwill & Balkwill* 284 (J); *ibidem*, 13 May 1994, *Cron, Balkwill & Balkwill* 285 (CM, E, J, LISC, RSA); Soutpansberg, roadside on Farm Punchbowl, 12 May 1994, *Cron, Balkwill & Balkwill* 282 (holotype J, isotypes B, K, MO, PRE, S); Soutpansberg, Farm Budworth, 14 May 1994, *Cron, Balkwill & Balkwill* 287 (BR, J, K, PRU); *ibidem*, 14 May 1994, *Cron, Balkwill & Balkwill* 288 (E, J, MO, S); *ibidem*, 14 May 1994, *Cron, Balkwill & Balkwill* 290 (J); Soutpansberg, summit of Franzhoek Peak, 10 July 1935, *Galpin* 14894 (BOL, K); Soutpansberg, 22 June 1946, *Compton* 18049 (NBG); Lake Fundudzi, 29 Oct. 1948, *Codd & Dyer* 4505 (K, PRE); *ibidem*, 16 May 1973, *Van Graan & Hardy* 550 (K, PRE); N of Tshixwada/Luheni en route to Gogogo, 1 July 2000, *Cron & Goodman* 581 (J, K, MO, PRE); Thabazimbi, Kransberg, 29 Feb. 1980, *Westfall* 932 (PRE); mountain peak near Lobyana, Lebowa, Drakensberg range between Strydom Tunnel and Legalameetse (The Downs), *Van Wyk & Matthews* 10550 (PRU).

Form with cobwebby leaves: Limpopo Province: Blouberg, 30 May 1953, *Esterhuysen* 21519 (BOL); *ibidem*, 7 Dec. 1997, *Cron, Knox & Winter* 344 (J); Lejuma, Soutpansberg, 10 Dec. 1997, *Cron, Knox & Winter* 363 (J, LISC).

29. *Cineraria ngwenyensis* Cron sp. nov. affinis *C. lobata* sed cypselis glabris et caulis foliisque pilis brevis vestitis differt. Typus: Swaziland, Mbabane Distr., Ngwenya Hills, W of Lion Cavern, 1600 m, 24 June 1995, *Cron, Balkwill & Balkwill* 308 (holotypus J!; isotypi K!, MO!, PRE!, S!).

Perennial herb, to 0.4 m tall. *Stems* woody and branching slightly towards the base, brown to reddish brown, often drying straw-coloured in upper parts, densely hairy. *Leaves* reniform to deltoid-reniform, very distinctly (3–)5–7-lobed, uppermost leaves occasionally with 1 or 2 pinnae, rarely pinnatisect into 3 or 5 distinct parts; lamina 5–19 × 6–31 mm, green, sometimes tinged reddish-purple, hairy to very densely hairy above and below; apex obtuse to rounded; margin coarsely dentate; base subcordate to cordate; petiole 8–35 mm long, hairy; auricles small, caducous, auriform and usually dissected into two lobes on either side of petiole. *Capitula* heterogamous, radiate, few (mostly 2–4, occasionally as many as 8) in a lax panicle; peduncles (12–)16–52(–55) mm long, sparsely hairy, glabrescent, with few or many small bracts 2–3 mm long. *Involucre* calyculate; phyllaries 12 or 13, 4–5 mm long, glabrous; margins scarious. *Ray florets* 8 or rarely 9, 5.0–8.0 mm long; limb 3.5–6.0 mm long, distinctly 4-veined (rarely 6-veined), veins reddish-brown. *Disc florets* 26–32; corolla (3.5–)4.0–

5.0 mm long, veins reddish-brown. *Cypselae* obovate, compressed with a median rib evident in mature cypselae, margined (to narrow-winged), brown or black with paler margins, 2–3 mm long, glabrous. *Pappus* to base of disc corolla lobes. Figs 14D, 16.

PHENOLOGY. Flowering April to June.

DISTRIBUTION. Swaziland, Ngwenya Hills (including Bomvu Ridge). (Map 13).

HABITAT. In shade of rocks on mountain slopes and north-west facing spurs, near the summit of the quartzite ridges in Swaziland, adjacent to iron-ore bearing rocks; 1500–1700 m.

CONSERVATION STATUS. Very rare and restricted in distribution with small populations, but it is protected within the Malolotja Nature Reserve. It qualifies as Vulnerable (VU D2), as its area of potential occupancy is estimated at about 100 km² as it occurs only amongst the rocky outcrops on the mountains. Currently it is known only from three localities.

KNOWN COLLECTIONS. SWAZILAND: Mbabane Distr., Bomvu Ridge, *Compton* 28822 (NBG, PRE); about 20 km N of Mbabane, Ngwenya Hills, Castle Peak, Lion Cavern, 7 April 1966, *Maguire* 7626/80 (J); Ngwenya Hills, Castle Peak, *Maguire* 7590 (J, K); Ngwenya Hills, W of Lion Cavern, 24 June 1995, *Cron, Balkwill & Balkwill* 308 (holotype J, isotypes K, MO, PRE, S); Ngwenya Plateau, 24 June 1995, *Cron, Balkwill & Balkwill* 311 (J).

NOTES. *Cineraria ngwenyensis*, known only from the Ngwenya Hills in Swaziland (Fig. 16A), is similar to *C. lobata* in growth form and leaf shape, but its cypselae are completely glabrous (Fig. 16B, D), as opposed to those of *C. lobata* which are hairy on either the margins only or both margins and faces. Its stems and leaves are densely covered with hairs (Fig. 16C, E), while *C. lobata* is commonly glabrous or sparsely hairy, except for a hairy form in the Western Cape, but then the trichomes differ. The trichomes in *C. ngwenyensis* are 10–12 cells long and eglandular, gradually tapering (Figs 3B2, 16F), but do not have the long apical appendage of the trichomes seen in the hairy form of *C. lobata* subsp. *lobata*. In addition, its involucre bracts are glabrous, whereas they are pilose in the hairy form of *C. lobata* subsp. *lobata*, which also usually has only 5 rays in contrast to the 8 or 9 rays present in *C. ngwenyensis*. The auricles of *C. ngwenyensis* are ovate to lanceolate in shape (Fig. 16E), as opposed to the auriform auricles commonly seen in *C. lobata*. They do however match the auricles of *C. lobata* subsp. *southpansbergensis*, but that taxon has glabrous or cobwebby, glabrescent leaves and its cypselae are ciliate and hairy.

The Ngwenya Hills in the Malolotja Nature Reserve in Swaziland fall into the Barberton Centre of Endemism, characterised by a complex and unique succession of deformed volcanic and sedimentary

strata (the Barberton Supergroup). Most of the endemics in this centre are grassland endemics, though not many are *Asteraceae* (Van Wyk & Smith 2001). This species occurs amongst the quartzite outcrops in the montane grassland of the high plateau (Fig. 16A), which also has clear links with the Afromontane Region. It may well occur on similar, less accessible peaks and plateaux in the reserve.

30. *Cineraria saxifraga* DC. (1838: 306); Harv. (1865: 311–312); Goldblatt & Manning (2000: 312). Type: South Africa, Eastern Cape, Zuurberg, 760 m [2500'], 30 Oct. 1829, *Drège* 2095 (lectotype designated here G-DC!, isolectotype P!, S!); syntypes: Albany, Grahamstown, May, *Ecklon* 798 (syntype G-DC!); Albany, Swartberg, Suurberg Range near Grahamstown, 610 m [2000'], June, *Ecklon* 1382 (syntype G-DC!); Albany, between Assagaybosch and Boschman's R., July, *Ecklon* 293 (syntype G-DC!).

C. saxifraga DC. var. *axillipila* DC. (1838: 307), **synon. nov.** Type: Uitenhage, Port Elizabeth and Cape Recife, July, *Ecklon* 1127 (holotype G-DC; isotype SAM).

Perennial suffrutex, erect or diffuse, to c. 0.35 m tall. *Stems* woody towards the base, branched, especially towards the base, glabrous. *Leaves* reniform, rarely with 1 or 2 lateral pinnae; lamina 5–22 × 6–32 mm, glabrous, slightly succulent; apex obtuse to rounded; margin coarsely dentate; base cuneate to truncate, occasionally subcordate; petiole 12–31 mm long, glabrous, but often with woolly buds in axils; auricles absent. *Capitula* heterogamous, radiate, few (2–8) to many (c. 24) in a lax corymbose panicle; peduncles 10–67 mm long, glabrous, minutely bracteate. *Involucre* calyculate, though sparsely so with bracts descending; phyllaries 8–12, 5–6 mm long, glabrous; margins scarious. *Ray florets* 5–6, 7.5–9.0 mm long; limb 4–6 mm long, 4-veined. *Disc florets* 16–22; corolla 4–6 mm long. *Cypselae* obovate, compressed, margined, dark brown, sometimes with paler margins, (2.6–)3.0–3.5 mm long, ciliate and hairy on both faces. *Pappus* c. 4 mm long. Fig. 14E.

PHENOLOGY. Flowering mainly between October and January, but also in August and September.

DISTRIBUTION. South Africa, Eastern Cape, predominantly in the Albany and Uitenhage Distrs, also in the Zuurberg (Map 14). Cultivated in St. Helena and Zimbabwe.

SELECTED COLLECTIONS. SOUTH AFRICA: Eastern Cape: Morocco, *Major F. Klein* s.n. (K); Queenstown, Feb. 1920, *Page* 16990 (BOL); Oudeberg (Oldenburg), *Masson* 834 (BM); Albany, Cradock Common, 5 Sept. 1971, *Bayliss BS* 4772 (MO, NBG, US); Zuurberg, *Drège* 2095 (holotype G-DC, isotypes P, S); Uitenhage, Zuurberg Range, Oct., *Drège* 10139 (K); Bulk R.

Reservoir, Oct. 1931, *Holland* 3658 (BOL, K); Uitenhage, Port Elizabeth and Cape Recife, *Ecklon* 1127 (G-DC; S); 20 miles from Jeffrey's Bay, 13 Nov. 1928, *Hutchinson* 1493 (BM, BOL, K); Albany, Zwartehoogde, Zuurberg near Grahamstown, *Ecklon* 1382 (syntype G-DC); between Assagaybosch and Boschmansriver, July, *Ecklon* 293 (syntype G-DC); Howieson's Poort, 17 Nov. 1928, *Hutchinson & Gillett* 1548 (BM, BOL, K, PRE); Albany, 8 Aug. 1969, *Barker* 10611 (NBG, PRE); Grahamstown Nature Reserve, Dassie Krantz, 2 Dec. 1977, *Hilliard & Burt* 10828 (K, NU, S); Grahamstown, March, *Ecklon & Zeyher* 937 (SAM); *ibidem*, May, *Ecklon* 798 (syntype G-DC); Bathurst Distr., Kap Valley, 4 Dec. 1977, *Hilliard & Burt* 10860 (S); Albany Distr., May 1893, *Schlechter* 2646 (K, P, PRE, Z); Bathurst, Spring Ridge, Martindale, 24 Dec. 1956, *Taylor* 5217 (NBG).

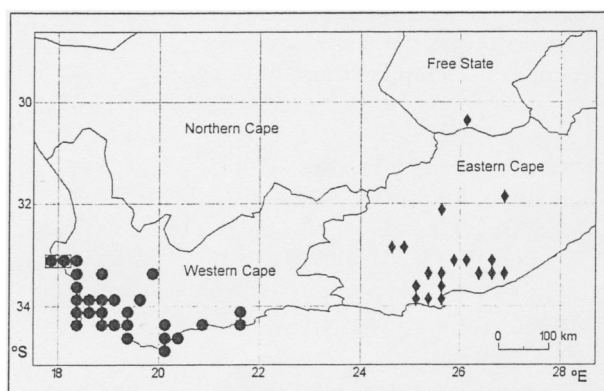
Cultivated: ST. HELENA: Barren Hill, *Wolley Dod* SH19/70 (K); Blue Hill, SW of island, *Kerr* 39 (BM); St. Helena, *Mrs Melliss* 21 (K). ZIMBABWE: Harare, 20 Jan. 1976, *Biegel* 5199 (K).

HABITAT. Growing in dry grassland, in semi-shade, often amongst rocks on hillsides, on the north to north-west aspect, also on rocky banks at roadside, on quartzite; 400 – 750 m (rarely as high as 1000 m in the Zuurberg).

CONSERVATION STATUS. Least Concern. *Cineraria saxifraga* has a restricted distribution, but is not rare in the area where it occurs and is grown in cultivation.

NOTES. *Cineraria saxifraga* is mainly recognised by its slightly succulent glabrous leaves with a more cuneate to truncate base than is common in *C. lobata*, to which it is otherwise similar in leaf shape and lobing, although the lobes are not as deeply cut. The leaves are exauriculate, unusual in *Cineraria*.

We agree with de Candolle (1838) that the woolly white buds in the axils supposedly distinguishing *Cineraria saxifraga* var. *axillipila* DC. are indicative of the youth of the specimen and do not perpetuate this name (also disregarded by Harvey 1865). This



Map 14. Known distribution of *Cineraria geifolia* (●), *C. angulosa* (□), and *C. saxifraga* (◆).

concentration of woolly white hairs on the young buds and in the axils of young leaves is also a common phenomenon in *C. lobata*.

Drège 2095 (G-DC) has been chosen as the lectotype as it is the specimen in the best condition and there is a duplicate in P (and possibly in S). The other syntypes have either very few or old capitula or no capitula left on them, but all are otherwise good matches of the original description.

This species is the only 'true' *Cineraria* that has been fairly widely cultivated and is available at some retail nurseries. It grows fairly easily in the garden, provided it receives sufficient water, morning sun and afternoon shade.

31. *Cineraria geifolia* (L.) L. (1763: 1242); Bergius (1767: 289); Miller (1768); L. (1784: 764); Aiton (1789: 220); Thunb. (1800: 155); Willd. (1803: 2077); W. T. Aiton (1813: 71); Sweet (1818: 189); Thunb. (1823: 671); Spreng. (1826: 545); DC. (1838: 307); Harv. (1865: 311); Levyns (1950: 808); Hilliard (1977: 382); Goldblatt & Manning (2000: 312). Type: South Africa, Cape of Good Hope, Herb. Clifford: 410, *Solidago* No. 7 (lectotype BM!), designated by Wijnands (1983: 73).

Othonna geifolia L. (1753: 924); 410; Kniph. (1763: 62). Type: as above.

C. geifolia var. *glabra* DC. (1838: 307), **synon. nov.** Type: South Africa, Western Cape, Hottentots-Holland, 1828, *M. Delessert* s.n. (holotype G-DC!).

Perennial herb, to c. 40 cm tall. *Stems* herbaceous to slightly woody, branching towards the base, usually flexuous, up to c. 5 mm in diameter at base, hairy or glabrous, distinctly lined. *Leaves* reniform, shallowly (to fairly deeply) lobed, rarely with a pair of lateral pinnae; lamina 6 – 35(– 45) × 9 – 50(– 72) mm, hairy or glabrous above and hairy or sparsely hairy below, or glabrous with few hairs in angles of lobes; apex rounded; margin coarsely dentate; base cordate (to subcordate in upper leaves); petiole 11 – 85 mm long, hairy; auricles conspicuous, auriform, caducous. *Capitula* heterogamous, radiate, few (3 – 6 per stem) to many (8 – 45) per stem) arranged in a lax (to fairly compact) corymbose panicle; peduncles 3 – 38(– 55) mm long, hairy or glabrous, bracteate. *Involucre* with few calyculus bracts; phyllaries 8 – 13, 4.0 – 5.5 mm long, hairy or glabrous; margins scarious. *Ray florets* 5 – 8(– 11), 6.0 – 9.0(– 11.5) mm long; limb 4.5 – 6.0 (– 8.0) mm long, 4(– 7)-veined. *Disc florets* (20 –) 30 – 54; corolla 4.0 – 5.5(– 6.0) mm long. *Cypselae* obovate, compressed, margined, ray cypselae occasionally narrow-winged, dark brown with paler margin, 2.2 – 3.0 mm long, ciliate with long whitish hairs, sparsely hairy (to hairy) on faces. *Pappus* 4.5 – 6.0 mm long. Fig. 14F.

PHENOLOGY. Flowering August to December.

ILLUSTRATION. Jan Moninckx in Commelijn (1701: t. 73); in Wijnands (1983: Plate 28).

DISTRIBUTION. South Africa, Western Cape: Cape Peninsula northwards to Saldanha Bay, eastwards to Caledon and Bredasdorp Distrs (Map 14).

SELECTED COLLECTIONS. SOUTH AFRICA: Western Cape: Malmesbury, W of Langebaan, *Pillans* 6971 (BOL); Cape Peninsula, Noordhoek, 2 Oct. 1980, *Hilliard & Burt* 13096 (K); near Kasteel Poort, *Wolley Dod* s.n. (BM, BOL); Table Mt, 1875–1880, *Rehmann* 719 (Z); University Grounds, Rondebosch, 2 Oct. 1972, *Esterhuysen* 32950 (BOL, MO, PRE); Devil's Peak, 22 Sept. 1895, *Wolley Dod* 221 (BOL, K); Camp's Bay, April 1847, *Prior* s.n. (K, Z); Kuilsrivier, *Zeyher* 920 (BOL, K); Robertson Distr., Onklaar, *Stokoe* 6606 (NBG); Sandy Bay, Simonstown, 26 Aug. 1978, *Van Jaarsveld* 3465 (NBG, PRE); Buffels R. Farm, near Darling, 19 Oct. 1970, *Barker* 10798 (NBG); Melkbosstrand, 24 Sept. 1966, *Dahlstrand* 1065 (MO, PRE); Hex R. Valley, Groot Tafelberg, *Rehmann* 2741 (Z); Eerste R. and Swart Klip, *Pillans* 9225 (BOL); Kuilsrivier, Nov., *Ecklon & Zeyher* 920 (SAM); Cape Flats, near Zwartklip, *Hilliard & Burt* 13076 (K, NU, S); Cape Flats, Sept. 1950, *Pillans* 10429 (K, US); Macassar Bay, 23 Sept. 1958, *Weidermann & Oberdieck* 194 (K, WAG); Simonstown, Strand, 9 Oct. 1944, *Parker* 3924 (K, BOL); Hottentot Hollandsberg, Oct. 1896, *MacOwan* 2733 (SAM); Hottentots-Holland, 1828, *M. Delessert* s.n. (G-DC); Kogelbaai, 8 Sept. 1969, *Boucher* 452 (PRE); De Wet's Bay, Betty's Bay, 10 Oct. 1981, *Mauve & Hugo* 117 (K, PRE); Kogelberg Forest Reserve, Rooi Els Hillside, 15 Oct. 1971, *Boucher* 1669 (PRE); Hermanus Nature Reserve, 9 Sept. 1980, *Robertson* 462 (MO, WAG); Caledon, Kleinmond, Nov. 1947, *de Vos* 7 (BOL); Sandbaai, Ystervarkpunt, 3 Oct. 1971, *Rycroft* 3110 (NBG); Baviaansfontein Hills, Uilenkraal Forest, between Kelders and Franskraal, 10 Oct. 1955, *Taylor* 1554 (SAM); Arniston, 24 Sept. 1956, *Chamberlaine* 84 (BM); Bredasdorp, mouth of Hagel Kraal R., 24 Sept. 1962, *Taylor* 4040 (PRE); Ystervarkpunt, between Gouritzmond and Stilbaai, 3 Oct. 1971, *Rycroft* 3110 (NBG); Cape of Good Hope, 12 Dec. 1937, *Levyns* 6391 (BOL); Sandbaai, Hermanus, 7 Sept. 1964, *Walters* 1143 (NBG); Swellendam, near Cape Infanta, 28 Sept. 1959, *Esterhuysen* 28332 (BOL).

HABITAT. This species grows amongst the dune vegetation at sea level in the Western Cape, an unusual habitat for *Cineraria*. It grows either on west or south-west-facing slopes (hairy form), or on east or south-east aspects of slopes (glabrous form), and also amongst rocks and on rocky outcrops (glabrous form), in sand, or in deep, damp soil, on shale; 10–60 m (–500 m, glabrous form).

CONSERVATION STATUS. Least Concern. Fairly widespread in the Western Cape and locally common.

NOTES. *Cineraria geifolia* is the type species for *Cineraria* (Wijnands 1983). It is characterised by reniform leaves on long petioles, fairly large capitula and commonly has eglandular spreading hairs (c. 10–12 cells long; Fig. 3B3) on the leaves and also on the involucre bracts.

Cineraria geifolia is generally distinguished from *C. lobata* by having more rounded reniform leaves with very shallow lobing and larger capitula. It has larger, more spreading trichomes (without an apical appendage, commonly seen in *C. lobata*) and is mostly more robust. The mature capitula of *C. geifolia* have very abundant pappus setae, a useful diagnostic characteristic for the species. The leaves of *C. lobata* are usually more distinctly and acutely lobed than those of *C. geifolia*.

De Candolle (1838: 307) suggested that there might be a glabrous variety of *Cineraria geifolia*, or that it was a variety of *C. lobata*. These plants have glabrous involucre bracts, more distinctly lobed leaves and sometimes a more suffrutescent growth form and the axils of the leaves have clusters of white woolly hairs. They tend to grow at higher altitudes and in rockier (less sandy) habitats than the hairy plants with very shallowly-lobed leaves. However, both glabrous and hairy forms also occur at same locality (as seen by collections on the same sheet): *Rycroft* 3110 (NBG) from Ystervarkpunt, *Levyns* 6391 (BOL) from the Cape of Good Hope, *Walters* 1143 (NBG) from Sandbaai, Hermanus and *Esterhuysen* 28332a, b (BOL) from near Cape Infanta. An intermediate form (less hairy, but not glabrous) is seen in *Esterhuysen* 28332c (BOL) also from near Cape Infanta. In the Cape Peninsula, however, it appears that *C. geifolia* and *C. lobata* may be hybridising, as the two species are very difficult to distinguish in this region.

Specimens from the high Drakensberg in the Eastern Cape, KwaZulu-Natal and Lesotho were previously included in *Cineraria geifolia* by Hilliard (1977), but these are more correctly placed in *C. erodioides*, based on trichome complement and auricle shape, although the shallowly-lobed leaves of some specimens do resemble those of *C. geifolia*.

32. *Cineraria angulosa* Lam. (1786: 6). Type: Cape of Good Hope, Lamarck Collection (holotype P-LA!).

C. humifusa L'Hér. (1788: 25); Willd. (1803: 2087); W. T. Aiton (1813: 75); DC. (1838: 306); Harv. (1865: 314); *synon. fide* Spreng. (1826: 550). Type: South Africa, ad Promontorium Bonae Spei, *Masson* s.n. (holotype BM!).

Perennial herb, up to 0.3 m tall. *Stems* woody and branching towards the base, slender, sparsely hairy or glabrous, lined. *Leaves* reniform in outline,

shallowly 5–7-lobed, occasionally with one pair of lateral pinnae; lamina 6–20 × 12–32 mm, glabrous above, sparsely hairy below, especially on veins and at junction with petiole; apex obtuse to rounded; margin coarsely dentate; base truncate to subcordate (occasionally to cordate in lower leaves); petiole 18–32 mm long, sparsely hairy; auricles absent or minute, auriform. *Capitula* heterogamous, radiate, solitary or more usually in two, occasionally threes; peduncles 11–92 mm long, sparsely hairy, bracteate, bracts c. 2 mm long, with glandular hairs on margins, basal bracts lobed and pinnatifid. *Involucre* calyculate; phyllaries 12 or 13, 5.5–6.5 mm long, with short eglandular or glandular hairs (6–8 cells long); margins scarious. *Ray florets* (5?–)7–8, 6.5–9.0 mm long; limb 4–6 mm long, 4-veined. *Disc florets* c. 25; corolla 4–5 mm long. *Cypselae* obovate, compressed, margined, blackish brown with paler margins when mature, 3–4 mm long, densely ciliate and hairy on faces. *Pappus* 4.0–4.5 mm long. Fig. 14G.

PHENOLOGY. Flowering mainly in September and October.

ILLUSTRATION. Hutchinson (1946: 89).

DISTRIBUTION. South Africa, Western Cape, near Saldanha Bay and Langebaan (Map 14).

KNOWN COLLECTIONS. SOUTH AFRICA: Western Cape: Saldanha Bay, 5 Sept. 1920, *Hutchinson* 289 (BM, K, PRE); *ibidem*, Sept. 1860, *Admiral Sir F. Grey* s.n. (K); Saldanha Bay, rocky hills E of Long Point, 6 Nov. 1963, *Nordenstam* 3288 (S); summit of second highest hill, Peninsula W of Langebaan, 11 Oct. 1933, *Pillans* 6971 (2 shts. BOL); Peninsula W of Langebaan, 11 Oct. 1933, *Pillans* 6980 (BOL); *ibidem*, 11 Oct. 1933, *Salter* 3922 (K); Langebaan Peninsula, South Head, 14 Aug. 1975, *Boucher* 2809 (PRE); Cape of Good Hope, *Masson* s.n. (holotype for *C. humifusa* BM); *ibidem*, *Nelson* s.n. (BM).

HABITAT. On rocks near the sea, in shallow sand, on granite outcrops; c. 30 m.

CONSERVATION STATUS. Endangered: EN Blab(ii, iii, v) + 2ab(ii, iii, v). Very rare and restricted in distribution; known from very few collections, most prior to 1940. More current data need to be collected.

NOTES. This species was previously known as *Cineraria humifusa*, but the Lamarck name *C. angulosa* predates it and should be applied, as indicated by Sprengel (1826: 55). The short eglandular trichomes (6–8 cells long; Fig. 3B1) on the involucre bracts distinguish *C. angulosa* from *C. geifolia*, which has much longer, spreading hairs (10–12 cells long). The hairs on the calyculus bracts and on young buds are clearly glandular, and glandular hairs are also present on the petiole and in the angles between the lobes of the leaves, also on the veins on the ventral surface of leaves of some specimens [e.g. *Pillans* 6971 (BOL)], and there are also cobwebby hairs around

the young buds and in the axils of the leaves. The dried leaves have a thin, membranous or papery texture and the petioles are very slender. *C. angulosa* is also characterised by solitary or few capitula on fairly long peduncles.

The specimen [*Drège* 556 (G-DC) from Graaff-Reinet] seen and cited by de Candolle (1838: 306) and Harvey (1865: 314) is not *Cineraria angulosa*. It is ecalyculate with tomentose leaves and is most likely a specimen of *Bolandia pedunculosa* (previously *C. pedunculosa*). Willdenow (1803) listed *C. pumila* Thunb. (1800: 155) [Type: *Thunberg* 19935 (UPS-THUNB)] as a synonym for *C. angulosa*, but this was matched to *Senecio repandus* Thunb. by Harvey (1865).

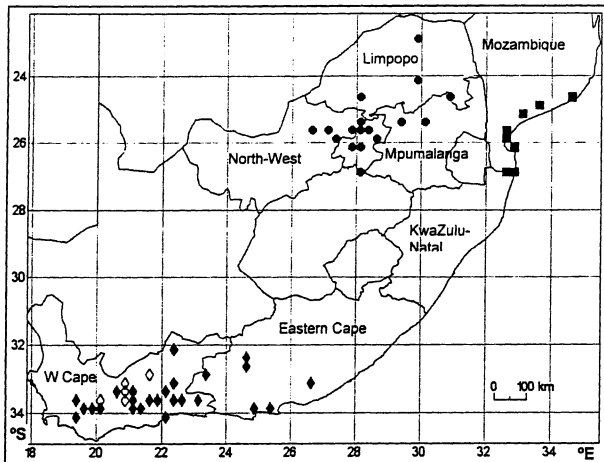
33. *Cineraria platycarpa* DC. (1838: 305); Harv. (1865: 313); Goldblatt & Manning (2000: 312). Type: Africa Capensi, 1835, *Drège* 5922 (holotype G-DC!; isotype P!).

Annual herb, (3–)7–20 cm tall, rarely as tall as 30 cm. *Stems* herbaceous, unbranched or branching slightly near the base, glabrous or sparsely hairy. *Leaves* lyrate-pinnatifid to reniform, commonly with two pinnae below lamina; lamina 6–25 × 9–32 mm, glabrous above, sparsely hairy below especially on the veins towards base of lamina, green above, undersurface of fresh leaves often purple; apex obtuse to rounded; margin coarsely dentate to crenate; base truncate to subcordate to cordate; petiole 12–58 mm long, glabrous or slightly cobwebby, with cobwebby hairs in axils; auricles usually small, auriform or widening of base of petiole. *Capitula* heterogamous, radiate, usually few (4–12) per stem branch, rarely as many as 24; peduncles 4–16 mm long, glabrous, sparsely bracteate. *Involucre* sparsely calyculate; phyllaries 7 or 8 (rarely 12), 3.5–4.0(–5.0) mm long, glabrous, green with pinkish apices; margins scarious. *Ray florets* 3 or 5, 4–6 mm long; limb 2.5–4.0 mm long, 4-veined. *Disc florets* 14–24; corolla 2.5–4.5 mm long. *Cypselae* obovate, compressed, either distinctly to broadly winged (wing c. 0.6 mm wide), dark brown with paler wings, fringed with hairs on wing and also on faces, especially central rib, or margined (not winged), black, fringed with white hairs on margins and outer faces, 2.5–3.0 mm long. *Pappus* about $\frac{3}{4}$ length of disc corolla. Fig. 14H.

PHENOLOGY. Flowering from July to October.

DISTRIBUTION. South Africa: Western and Eastern Cape (Map 15).

SELECTED COLLECTIONS. (i) Form with black, margined cypselae (not broad winged), fringed with white hairs and hairy on outer face: SOUTH AFRICA: Western Cape: Prince Albert Distr., 20 miles W of Port Alfred, 14 Sept. 1955, *Leistner* 236 (PRE); Swartberg near Prince



Map 15. Known distribution of *Cineraria platycarpa* (◆ broad-winged form; ◇ margined form), *C. pinnata* (■), and *C. parvifolia* (●).

Albert, Dec. 1905, *Bolus* 12021 (BOL); Laingsburg Distr., 14 miles SSE of Laingsburg, 25 July 1959, *Acocks* 20510 (K, PRE); Wittepoort, Ladismith, *Compton* 7865 (NBG); Montagu, top of Ouberg Pass, 27 Sept. 1997, *Goldblatt & Manning* 10771 (PRE); Western end of Touwsberg, Ladismith, 19 Aug. 1956, *Wurts* 1435 (NBG); Touwsberg, Farm Zorgvliet 129, 5 Oct. 1993, *Victor* 409 (PRE); Montagu Baths, Oct. 1921, *Page* 47 (PRE); Africa Capensi, 1835, *Drège* 5922 (holotype G-DC, isotype P).

(ii) Form with brown cypselae with distinct or broad wings, fringed with hairs: **SOUTH AFRICA:** Western Cape: Prince Albert Distr., Tierberg, 27 July 1990, *Dean* 983 (PRE); Beaufort West Distr., Farm Kalkdam along Bosdwiervier, 10 Oct. 1983, *Retief & Reid* 314 (K, PRE); Waterburrow, near Graaff-Reinet, Aug. 1895, *Bolus* 3873 (BOL); Kendrew Distr., 23 May 1952, *Theron* 1243 (PRE); Robertson Division, near Wansbek, 26 Aug. 1965, *Van Breda & Joubert* 1985 (PRE); Robertson, 7 Oct. 1929, *Levyns* 4344 (BOL); Anysberg Nature Reserve, Ladismith, 12 Aug. 1993, *Victor* 171 (BOL, PRE); Bonnievale, 1 Oct. 1923, *Marloth* 1108 (PRE); below Klein Swartberg Mts, Farm Rouxpos, 29 Sept. 1981, *Stirton* 9495 (PRE); Little Karoo, Noukloof Nature Reserve, 6 July 1978, *Laidler* 57 (PRE); Roodeberg, 1 Nov. 1931, *Compton* 3861 (BOL); Riversdale, Sopieshoogte, near entrance to Garcia's Pass, 15 Sept. 1981, *Fellingham* 125 (PRE, WAG); near Moordkuil, Farm Alfalfa, 26 Sept. 1983, *Goldblatt & Snijman* 6972 (PRE); Touwsberg, Farm Rietfontein, 7 Oct. 1993, *Smook* 8706 (PRE); Die Krans Farm, 21 July 1973, *Dahlstrand* 2423 (J, PRE); Doornkraal, 3 miles E of de Rust, 19 Oct. 1970, *Dahlstrand* 1452 (J, PRE); Uniondale, 14 to 15 miles from Uniondale on road to Willowmore, Oct. 1930, *Fourcade* 4384 (BOL, K); Hankey Pass, 3 Oct. 1979, *Cowling* 958 (GRA); Despatch, 9 Sept. 1947, *Rodin*

1204 (BOL, K, PRE, US); Uitenhage, Nov./Dec. 1925, *Thode* A666 (K, NH, PRE); Caledon, Aug. 1927, *Leipoldt* s.n. sub BOL 50440 (BOL); Klein Brak R., 8 Oct. 1928, *Gillett* 1245 (BOL).

HABITAT. Commonly in the shade of larger bushes or boulders in the Karoo or in Valley Bushveld or 'Renosterbos' or rarely in coastal bush in the Eastern Cape, often on south-facing slopes, on Bokkeveld and Ecce shales; 20–900 m.

CONSERVATION STATUS. Least Concern. Reportedly locally common, especially in areas that have wet winters. Possibly threatened by the predicted increase in global temperatures and severe drought experienced in the Karoo over the past few years.

NOTES. There appear to be two distinct forms of *Cineraria platycarpa* based on the extensions of the cypselae, (i) a form with black, margined cypselae, fringed with white hairs, and (ii) a form with brown, broadly or distinctly winged cypselae, also fringed with hairs. The first form matches the type, but the name has been applied equally to the second form, which is very similar in growth form, leaf shape and texture. A transitional specimen is seen in *Page* 47 (PRE) from Montagu Baths, in which most of the cypselae in a capitulum are not broad-winged, except for one. The weak root system of this annual herb is evident on a number of specimens, including *Bayer* 212 (NBG, PRE), *Retief & Reid* 314 (K, PRE), *Dahlstrand* 1452 (J, PRE), and *Gillett* 1245 (BOL).

This species could be (and has on occasion been) mistaken for *Stilpnogyne bellidioides* DC., which also occurs in the Karoo and has a similar growth form and leaf texture. However *Stilpnogyne* is disciform and ecalyculate with the involucre bracts connate at the base (Bremer 1994). It is also sometimes very difficult to distinguish young plants of *Cineraria lobata* subsp. *platyptera* from *C. platycarpa* in the Eastern Cape, as both have the broad-winged ray cypselae and are small and softly herbaceous.

34. *Cineraria pinnata* O. Hoffm. ex Schinz (1900: 73). Type: Mozambique, Maputo (Delagoa Bay), Sept. 1890, *Junod* 91 (holotype Z; isotype BR!).

Annual or possibly short-lived perennial herb, erect to 40 cm tall. *Stems* herbaceous, but slightly woody towards the base, slender, 2.0–3.5 mm in diameter at base, unbranched or with few branches, glabrous. *Leaves* lyrate-pinnatifid (uppermost) or deltoid to deltoid-reniform, usually with 1–4 pairs of lateral leaflets below lamina, terminal leaflet largest; lamina (including first pair of leaflets) 10–32(–45) × 8–30 mm, total leaf length up to 90 mm long with petiole accounting for half to one third of length, glabrous, usually with few glandular hairs in angles of lobes, occasionally

sparsely hairy on veins below, texture usually 'papery-thin'; apex acute; margin coarsely dentate; base cuneate to truncate to subcordate; petiole 7–35(–50) mm long, glabrous, with cobwebby axils; auricles small, lanceolate, sometimes dentate, caducous. *Capitula* heterogamous, radiate, usually few (2–12 per branch), rarely as many as 40 per branch in a lax corymbose panicle; peduncles 5–32 mm long, glabrous, with few minute bracts descending (rarely densely bracteate). *Involucre* calyculate; phyllaries (7–)8–12, 4 mm long, glabrous; margins scarious. *Ray florets* 5–8, 4–6 mm long; limb 3.0–4.2 mm long, 4-veined. *Disc florets* c. 24; corolla 3.0–3.5 mm long. *Cypselae* narrowly obovate, compressed, margined, brown, 2.2–2.5 mm long, sparsely to fairly ciliate; faces usually sparsely hairy, occasionally glabrous. *Pappus* approximately equal to length of disc floret corolla. Fig. 14J.

PHENOLOGY. Flowering from August to November, occasionally as early as July.

DISTRIBUTION. Mozambique, including Inhaca Island, and in northern Maputaland, KwaZulu-Natal, South Africa. (Map 15).

KNOWN COLLECTIONS. MOZAMBIQUE: Gaza, between Chiconela and Gumbe, c. 14 km from Chiconela, 26 May 1965, *Pereira, Marques & Balsinhas* 478 (WAG); Zavala, Sept. 1975, *A. Moura et al.* 361 (WAG); Maputo, 23 July 1947, *Barbosa* 284 (PRE); Ricatla near Maputo, Sept. 1890, *Junod* 91 (holotype Z, isotype BR); Sul do Save, Marracuene, 1 Aug. 1952, *Barbosa & Myre* 215 (BR, NU, PRE); Gaza, Masiene, Sept. 1924, *Van Dam* s.n. sub TM25325 (NH, PRE); Gaza: Bilene, 14 km da Praia de S. Martinho para a Macia, Nov. 1969, *Correia & Marques* 1415 (WAG); Inyamasan, Jan. 1898, *Schlechter* 12068 (Z); Inhaca Island, Nov. 1935, *M. Moss* s.n. sub J27397 (J). **SOUTH AFRICA:** KwaZulu-Natal: Ingwavuma Distr., Muzi Swamp, 23 Oct. 1971, *Moll & Nel* 5583 (NH, NU); Ingwavuma Distr., Lake Nhlange, Kosi Bay, 23 Sept. 1945, *Vahrmeijer* 1245 (K, PRE); Kosi Bay Nature Reserve, Lake Nhlange, 14 Oct. 1998, *Kyle* 2 (NH, PRE); Kosi Lake, 19 Nov. 1982, *Balkwill* 605 (NU); Kosi Bay, W side of Lake Nhlange, 13 Aug. 1988, *Venter* 13013 (PRE).

cf. pinnata: Mozambique, Inhaca Island, 7 March 1958, *Mogg* 31571 (J).

HABITAT. Coastal grassland or bush, seasonal wetlands, in sandy soil, also under trees; 20–70 m.

CONSERVATION STATUS. This species has been assessed as Data Deficient (Scott-Shaw 1999), but is here assessed as Near Threatened for South Africa and Least Concern globally. It has a fairly restricted distribution and scattered occurrence. Its habitat is possibly threatened by increased human activity in the region post civil war in southern Mozambique, and more data are needed on the current status of the species in the region.

NOTES. *Cineraria pinnata* is a small, slender herb with

lyrate-pinnatifid leaves, with a characteristically thin, soft texture. The leaves are glabrous, except for a few hairs on the veins below, and a few glandular trichomes in angles of the lobes. The florets have been noted to be scented [*Venter* 13013 (PRE)]. There is a variable degree of hairiness on the cypselae, with a collection from between Chiconela and Gumbe, in Gaza, Mozambique [*Pereira, Marques & Balsinhas* 478 (WAG)] having entirely glabrous cypselae.

Mogg 31571 (J) from Inhaca Island is similar to *C. pinnata* in leaf shape, but has larger capitula with 12 or 13 rays, densely bracteate peduncles and glabrous cypselae. Its identity remains uncertain.

Cineraria pinnata may be confused with *C. parvifolia*, but that species grows in an entirely different region and habitat at much higher altitudes inland. Its uppermost leaves are less pinnatisect than in *C. parvifolia*, and its middle to lower leaves are more deltoid compared to the reniform, undissected lower leaves sometimes seen in *C. parvifolia*.

35. *Cineraria parvifolia* Burt Davy in Burt Davy & Hutchinson (1936: 81). Type: South Africa, Gauteng, Pretoria, Irene, near summit of Meintjies Kop, 29 March 1908, *Burt Davy* 7791 (holotype K!).

Annual or short-lived perennial herb, 0.3–0.5(–1.0) m tall. *Stems* slender, slightly woody, branching mainly towards the base, glabrous. *Leaves:* upper leaves pinnatisect or lyrate-pinnatifid with 3–5 pinnae, the terminal pinna usually the largest, 10–42 × 8–30 mm, middle to lower leaves commonly reniform, 5–7-lobed with 1–2 lateral pinnae along petiole; lamina 12–32 × 13–25 mm, glabrous, but with few hairs in angles of lobes, and cobwebby when young; apex acute to obtuse; margin dentate; base truncate to subcordate; petiole 3–41 mm long, glabrous, with cobwebby hairs in axils; auricles small and caducous, lanceolate, dentate. *Capitula* heterogamous, radiate, 8–24 per stem branch arranged in lax corymbs; peduncles 8–68 mm long, glabrous, with few or no bracteoles. *Involucre* calyculate; phyllaries 8–12(–13), 4–5 mm long, glabrous; margins scarious. *Ray florets* 6–8, 6–8 mm long; limb 4–6 mm long, 4- (occasionally 5-) veined. *Disc florets* c. 30; corolla 3.0–4.2 mm long. *Cypselae* obovate, compressed with prominent median rib on inner face when mature, distinctly margined, dark brown or black with brown margins, 2.0–2.2 mm long, ciliate and hairy to sparsely hairy on faces. *Pappus* about $\frac{3}{4}$ length of corolla. Fig. 14K.

PHENOLOGY. Flowering mainly from February to June, rarely in October or November.

DISTRIBUTION. Mainly in the hills of Gauteng, but also known from a few collections in Limpopo,

Mpumalanga, and North-West provinces, South Africa (Map 15).

SELECTED COLLECTIONS. SOUTH AFRICA: Limpopo Province: Rushton, 13 March 1985, *Raal* 254 (PRE); Warmbaths Distr., on Farm Zandmuier 397(22)KR, 7 April 1996, *Sebola et al.* 297 (J); Polokwane Distr., Wolkberg on Farm Flynn 217 KS, 9 April 1990, *Balkwill et al.* 5576 (J); North-West Province: Rustenberg Nature Reserve, 31 March 1970, *Jacobson* 920 (PRE); Mountain View, S slope of Magaliesberg, 20 April 1928, *Mogg* 15151 (PRE); Brits, 12 Nov. 1957, *Van Vuuren* 373 (PRE); Hartebeespoort, 2 Nov. 1925, *C. E. Moss* 11365 (J); Crocodile and Magalies Rs, 31 May 1903, *Burt Davy* 199 (PRE); Gauteng: Wonderboom Reserve, *Repton* 2073 (PRE); Pretoria, Irene, Meintjies Kop, 29 March 1908, *Burt Davy* 7791 (holotype K); near Pretoria, 4 May 1924, *Moss* 9649 (BOL, J); Hornsnek, c. 12 miles W of Pretoria, 2 July 1955, *Schlieben* 7047 (US); Pretoria West, below Fort West, 18 April 2000, *De Castro* s.n. (J); Hills to N of Pretoria, *Scott Elliot* 1390 (E); Donkerpoort, on Silverton-Bronkhorstspuit road, 24 March 1938, *Young* 2462 (PRE); Trichardtspoort, 21 miles NE of Bronkhorstspuit, 7 May 1948, *Codd* 4175 (K, PRE); Witpoortjie Kloof, 7 May 1918, *Moss* 2606 (J); Witpoortjie, *Murray* 560 (PRE); Witwatersrand Botanic Garden, Roodepoort, 4 April 1983, *Behr* 457 (NBG); Krugersdorp Distr., Farm Nooitgedacht, 22 April 1941, *Van Rensburg* 1965 (J); Mt Arabel, 30 miles S of Johannesburg, *Mogg* 22954b (PRE); Mpumalanga: along road between Bourke's Luck and Pilgrims Rest, 16 Feb. 1981, *Welman* 283 (PRE); Loskop Dam, Kloppersloop, 5 May 1967, *Theron* 1395 (PRE, PRU); Dullstroom, Farm Houtenbeck, 18 April 1988, *Burgoyne* 270 (PRE, PRU).

cf. parvifolia: Steenkampsberg mountain pass, 30 km from Roosenekal on R577, 23 Feb. 1996, *Snow & Burgoyne* 7044 (PRE).

HABITAT. Usually growing in shade amongst rocks on moderate-to-steep south-facing slopes and rocky ledges, in open montane grassland and at the base of cliffs and beneath trees, also at edge of woodlands and near rivers, occasionally in disturbed areas, commonly on humus-rich, sandy loams, on quartzite; 1250 – 1600 m.

CONSERVATION STATUS. Least Concern. A fairly widespread species, but not common and occurring in relatively small populations. Its habitat is somewhat threatened by urban development in Gauteng.

NOTES. *Cineraria parvifolia* is a very slender herb, with small leaves and capitula. Its uppermost leaves are usually lyrate-pinnatifid, but its lower leaves are often reniform with a few lateral pinnae below the lamina. *C. parvifolia* could be confused with *C. pinnata*, but that species grows at much lower altitude in marshy conditions in the Maputaland region and adjacent coastal regions of southern Mozambique. Its uppermost leaves tend to be more dissected than in

C. pinnata with smaller lobes, and its middle to lower leaves (if entire) are reniform, not deltoid or deltoid-reniform as in *C. pinnata*. *C. parvifolia* could also possibly be confused with *C. geraniifolia*, especially when its leaves are not very dissected, but that species has longer peduncles, larger capitula and glabrous cypselae. Its habit and leaves may also resemble *C. lyratiformis*, but that has glabrous, broad-winged cypselae.

The degree of hairiness on the cypselae varies, especially on the faces, occasionally being entirely glabrous [e.g. *Murray* 560 (PRE) from Witpoortjie, Gauteng]. A collection [*Snow & Burgoyne* 7044 (PRE)] from 2000 m on the Steenkampsberg mountain pass, the highest in the region previously known as the 'Transvaal', matches *Cineraria parvifolia* but has much larger capitula than usual, probably a function of the high altitude.

Species insufficiently known

Cineraria pentactina Hook. f. (1901: t 7799). Type: Hort. Kew., 11 June 1900 (holotype K!).

Known only from the description and type of a cultivated specimen grown at Kew, and not matched definitely with any other species. Possibly a cultivated form of *Cineraria saxifraga* or *C. lobata*, but no longer growing in glass houses at Kew. Contrary to the description (1901: 7799), its capitula are calyculate. The absence of auricles is unusual in *Cineraria*, also seen in *C. saxifraga*, although its climbing habit is more characteristic of *C. deltoidea*.

Cineraria volubilis Spreng. f. (1828: 24). = ? Type: South Africa, Cape Province, *Zeyher* 70 (?).

The type of *Cineraria volubilis* has not been seen by the authors and its location is not known.

Cineraria lanosa DC. (1838: 309). = ? Type: South Africa, Cap. Bonae Spei. Specimen not traced.

Cineraria lanata Jacq. (1791: 177); J. F. Gmel. (1796: 1238); Thunb. (1800: 155; 1823: 671), *nom. illeg.*; non *C. lanata* Lam. (1786: 7); non *C. lanata* L'Hér. (1789: 25); *synon. fide* DC. (1838: 309). Type: Hort. bot. Vind., *Jacquin* s.n. (lectotype designated here, W, image!).

Species excluded from genus

Cineraria albomontana Hilliard (1989: 185 – 187) = *Bolandia pedunculosa* (DC.) Cron in Cron *et al.* (2006c: 226 – 227). Type of *C. albomontana*: South

Africa, Eastern Cape, Lady Grey, Witteberg, Joubert's Pass, O. M. Hilliard & B. L. Burt 12177 (holotype E; isotypes K!, NU!, S!).

Cineraria pedunculosa DC. (1838: 305) = **Bolandia pedunculosa** (DC.) Cron. Type of *B. pedunculosa*: South Africa, Western Cape, Caledon, Potrivier, Langehoogde, Bontjeskraal, bis am Zwarteberg, 165 – 660 m [500 – 2000'], C. F. Ecklon & C. L. P. Zeyher 1519 (holotype G-DC!; isotype S!).

Cineraria argillacea Cron in Cron & Balkwill (1997: 402 – 403) = **Bolandia argillacea** (Cron) Cron in Cron et al. (2006c: 225 – 226). Type: South Africa, Western Cape, Worcester Distr., on slopes at base of Brandwacht Peak, E. Esterhuysen 35117 (holotype BOL; isotypes K!, S!, UPS!).

Cineraria dregeana DC. (1838: 305) = **Senecio gariapiensis** Cron nom. nov. Type: South Africa: 'Ufer der Gariiep', 1835?, Drège 2717 (holotype G-DC!).

Annual? herb. *Stems* erect, herbaceous, branched, glabrous. *Leaves*: upper leaves oblong, glabrous; apex obtuse; margin coarsely dentate; base amplexicaul, sessile; auricles merge with lamina. *Capitula* heterogamous, radiate, in a lax corymb; peduncles c. 10 mm long, glabrous, bracteolate. *Involucre* sparsely calyculate; phyllaries c. 12?, c. 6 mm long, narrow, glabrous, margins narrowly scarious. *Ray florets* reduced, c. 4.5 mm long. *Disc florets* present, corolla c. 4.5 mm long. *Cypselae* cylindrical, not compressed, angular, not margined, brown, 2.8 – 3.0 mm long densely ciliate all over, covered with short white hairs. *Pappus* of fine white scabrid bristles, waxy, 4 mm long.

PHENOLOGY. Flowering time not known.

DISTRIBUTION. South Africa. Northern Cape: On the banks of the Gariiep (Orange) R.

HABITAT. Not known.

CONSERVATION STATUS. Data deficient.

NOTES. This species is known only from the type collection, in poor condition and lacking lower leaves, but clearly lacks key diagnostic features of *Cineraria*: its cypselae are not compressed, are quadrangular in cross section and lack a distinct carpopodium, and its leaves are sessile, pinnately veined with amplexicaul bases. In addition, its involucre bracts are much narrower than those of *Cineraria*. Originally described as discoid (de Candolle 1838: 308), very reduced, narrow rays are seen on the few younger capitula present on the specimen. The ray florets are no longer than the disc florets and do not protrude beyond the involucre bracts. This species is better placed in *Senecio sensu lato*.

Cineraria exilis DC. (1838: 305); Harv. (1865: 313) = ? Type: South Africa, Northern Cape, Vryburg Division, across TransGariiep region, near Litakun, at the source of the Moshoweng R., 27 Sept. 1812, Burchell 2274 (holotype G-DC!; isotype K!).

Annual herb, about 0.15 m tall. *Stems* herbaceous, unbranched or branching from the base, glabrous. *Leaves* elliptic to obovate, rarely with a lateral pinna, lamina 6 – 15 × 2.5 – 5 mm, glabrous; apex acute to obtuse; margin dentate; base cuneate, often decurrent and clasping stem; petiole 4 – 6 mm long, present on lower leaves only, glabrous; auricles absent. *Capitula* homogamous, discoid, usually in pairs, occasionally solitary; peduncles 43 – 83 mm long, glabrous, sparsely bracteate, basal bracts c. 3 mm long. *Involucre* very sparsely calyculate; phyllaries 17 – 20, 4.5 – 5.0 mm long, narrow (0.6 – 0.7 mm wide), glabrous; margins scarious. *Ray florets* absent. *Disc florets* c. 36; corolla 2.8 – 3.0 mm long. *Cypselae* oblong to elliptic, curved, slightly compressed, with 3 or 4 distinct ribs, outer surface convex, dark brown to black when mature, 2.0 mm long, with white hairs on ribs, inner surface of outer cypselae glabrous. *Pappus* c. 4 mm long.

PHENOLOGY. Flowering September.

DISTRIBUTION. Known only from the type locality: South Africa, Northern Cape, Vryburg Division, near Litakun.

HABITAT. Unknown.

CONSERVATION STATUS. Data Deficient. Known only from the type collection.

NOTES. The cypselae of this species appear to resemble those of *Bolandia* and *Mesogramma*, but it has discoid capitula in contrast to the radiate capitula of these two genera.

Cineraria hederifolia Cron = **Senecio hederiformis** Cron nom. nov.

Cineraria hederifolia Cron (1994: 166 – 167). Type: South Africa, Mpumalanga, Pilgrims Rest Distr., c. 30 km N of Graskop, near the Treur R., 20 March 1994, Cron, Balkwill & Balkwill 245 (holotype J!; isotypes E!, K!, MO!, PRE!).

Cineraria microglossa DC. (1838: 305); Harv. (1865: 313) = **Mesogramma apiifolium** DC. (1838: 304); DC. in Delessert (1838: t. 58); *synon. fide* Nordenstam & Cron (2006). Type of *C. microglossa*: South Africa, Northern Cape, in the Gariiep region, 19 Sept. 1930, Drège 5926 (holotype G-DC!, isotypes K!, P!).

Senecio apiifolius (DC.) Benth. & Hook. f. ex O. Hoffm. (1892: 298), comb. non rite publ.; *Senecio apiifolius* (DC.) Benth. & Hook. f. ex Medonça (1943: 119). Type: Ufer des Gariiep, Drège 2823 (lectotype G-DC; isolectotype S).

Senecio peculiaris Dinter (1932: 94). Type: Namibia, Garius bei Warmbad im Rivier an dauernd feuchten Stellen des Wasserfalles, 30 Nov. 1922, Dinter 4252 (B†).

PHENOLOGY. *Cineraria microglossa* was collected flowering in September, and *Mesogramma apiifolium* is known to flower from June to November.

DISTRIBUTION. Now known to be widespread in Namibia, north-western Botswana and the Northern Cape, North West Province and Limpopo Province (Nordenstam & Pelsner 2005; Nordenstam & Cron 2006), although *Cineraria microglossa* was previously known only from type collections in the Gariep region, probably near the junction of the Orange and Fish Rivers.

HABITAT. Unknown for *Cineraria microglossa*, but *Mesogramma apiifolium* grows in a wide range of soil types (sandy loam, clay, silt), frequently at the edge of rivers or pans or in damp places in dry river beds and pans. It also commonly grows in disturbed areas near dams, on roadsides and in cultivated or fallow fields.

CONSERVATION STATUS. Least concern.

NOTES. The cypselae of *Mesogramma* are similar to the disc cypselae of *Bolandia*: black with rows of short white duplex hairs on the ribs. However, *Mesogramma* has a sparsely calyculate involucre and branching synflorescence, whereas the capitula of *Bolandia* are ecalyculate and solitary and the style has a central tuft of papillae on its apices (not seen in *Mesogramma*).

Cineraria mitellifolia L'Hér. (1788: 25); S. Moore (1903: 406) = *Senecio cordifolius* L. f. (1781: 372); J. F. Gmel. (1796: 1230); Thunb. (1800: 158; 1823: 683); DC. (1838: 394); Harv. (1865: 374). Type: South Africa, LINN. 996.74 (lectotype designated here LINN!).

C. chamaedrifolia Lam. (1786: 9); Spreng. (1826: 551); **synon. nov.** Type: Lamarck collection (P-LA!).

Perennial loosely erect or decumbent herb, up to 0.3 m tall. *Stems* herbaceous, unbranched (or slightly branched?), somewhat stoloniferous, rooting along their length, glabrous. *Leaves* ovate to elliptic, not lobed, lamina 13–29 × 7–21 mm, glabrous with few eglandular hairs in angles of teeth, paler green below; apex acute to obtuse; margin coarsely dentate; base truncate to subcordate to cordate; petiole 2–22 mm long, sparsely hairy; auricles absent, petiole widens slightly at the base. *Capitula* heterogamous, radiate, solitary or in two; peduncles (21–) 35–150 mm long, glabrous, bracteolate. *Involucre* sparsely calyculate; phyllaries 12 or 13, 5.5–6.0 mm long, glabrous, green with reddish tips; margins scarious. *Ray florets* 7 or 8, 9.5–14.0 mm long; limb (5.0–) 6.5–10.0 mm long, 4-veined. *Disc florets* 18–24; corolla 4.5–5.5 mm long. *Cypselae* narrowly oblong to fusiform, not compressed

when mature, not margined, brown, 2.5–3.2 mm long, glabrous. *Pappus* 4.0–5.5 mm long.

PHENOLOGY. Flowering from October to January.

DISTRIBUTION. South Africa, in the Western Cape, in the mountains of the Stellenbosch and Worcester regions as well as along the Cape Peninsula.

HABITAT. Montane grassland, often on steep south-facing slopes and usually sheltered by rocks or in ravines; 550–1200 m.

CONSERVATION STATUS. Least Concern. Not widespread or common, occasionally locally abundant.

SELECTED COLLECTIONS. SOUTH AFRICA: Western Cape: Cape Peninsula, Oct. 1918, *Marloth* 7785 (PRE); Drakensteinberg, *Drège* s.n. (BM); summit of Devil's Peak, 4 March 1896, *Wolley Dod* 890 (BM, K); Table Mountain, Disa Gorge, 13 Jan. 1923, *Moss* 7240 (J); Table Mountain, Nursery Ravine, 18 Jan. 1998, *Cron & Hodgkiss* 369 (E, J, K, MO); Table Mountain, 27 Feb. 1944, *Esterhuysen* 10059 (NBG); *ibidem*, *Thunberg* 19555 (UPS); Dwarsberg, Jonkershoek, March 1980, *Taylor* 10184 (K); Stellenbosch, Jonkershoek, 1 Feb. 1968, *Geldenhuis* GE 9 (PRE); Du Toit's Kloof, *Drège* 10139 (K); Waaihoek Peak, 24 Jan. 1954, *Esterhuysen* 22678 (PRE); Swellendam, Langeberg Mts, April 1887, *Bolus* 626 (BM, K); Noordhoek, 29 Jan. 1928, *Salter* 283/10 (BM, K); Caledon Distr., Babylon's Tower, 24 Feb. 1941, *Esterhuysen* 4995 (NBG).

NOTES. *Senecio cordifolius* was first described by Linné f. (1781: 372), but it was removed to *Cineraria* by L'Héritier in 1788, who named it *C. mitellaefolia* as there was already a *C. cordifolia* Jacq. (= *Senecio alpinus* Scop.) in existence. De Candolle (1838) and Harvey (1865) both retained the species in *Senecio*, and it was Moore (1903) who 'confirmed' its status as a *Cineraria*. However, the pinnately-veined, exauriculate leaves, and the oblong to fusiform, non-compressed mature cypselae of this species indicate that it is better placed in *Senecio sensu lato* than in *Cineraria*, as do cladistic analyses based on chloroplast and nuclear DNA sequence data (Cron 2005). It is therefore here reinstated as *Senecio cordifolius* L. f. [Note: The 'ae' in *mitellaefolia* was replaced by an 'i' (Arnold & de Wet 1993; Herman 2003, though not in *Index Kewensis*) due to it being an orthographic error according to the ICBN Article 60G.1a.]

Linné (1781: 372) refers to a Sparrmann specimen, however, the only specimen of *Senecio cordifolius* in the Linnean collection (LINN 996.74) bears no indication as to who collected it. Nevertheless, the annotation is by Linnaeus, who worked very closely with his son (N. Turland *pers. comm.*). As it is the only specimen of *S. cordifolius* in the collection, is in good condition and a good match of the original description, it is the logical choice for the lectotype. A *Masson & Nelson* specimen in BM bears a type specimen label, but it could not have been seen by Linné.

Cineraria othonnoides Harv. (1865: 314) = ?
Othonna pinnatifida Thunb. (1823: 721); DC. (1838: 482). Type: Cap. Bonae Spei, *Thunberg* 20891 (holotype UPS-THUNB!).

Harvey (1865: 314) created a separate division 'Othonnoides' for this species, although he indicated that he was not sure about its placement in *Cineraria* with a question mark after the 'C' in '*C.?* *othonnoides*'. The leaves are sessile, pinnatifid and are not palmately veined, nor are they auriculate as is common in *Cineraria*. The solitary capitula are ecalyculate and unusual scalloped ridges are present at the base of the involucre bracts (Harvey (l.c.) describes this phenomenon as follows: "the expanded apex of the peduncle is minutely dentate, the teeth alternating with the involucre scales"). The cypselae are not at all compressed and are densely covered in red-brown hairs. This unusual species clearly does not belong in *Cineraria*, and its position requires further investigation.

Cineraria pedunculosa DC. (1838: 305) = **Bolandia pedunculosa** (DC.) Cron in Cron *et al.* (2006c: 226–227). Type: South Africa, Western Cape, Caledon, Potrivier, Langehoogde, Bontjeskraal, bis am Zwarteberg, 165–660 m [500–2000'], *C. F. Ecklon & C. L. P. Zeyher* 1519 (holotype G-DC!; isotype SI!).

Cineraria purpurata L. (1767: 285) = ? Type: LINN. 1000.26 (lectotype **designated here** LINN!).

Leaves obovate, pinnately veined and tomentose below, exauriculate. Involucre biseriate (or possibly even triseriate?). Rays purple.

Cineraria sonchifolia L. (1763: 1243) = ? Rays purple. Type not known.

Cineraria spinulosa Lam. (1786: 9); Spreng. (1826: 549) = **Othonna parviflora** P. J. Bergius (1767: 335); *synon. fide* Nordenstam & Cron (2006). Type of *C. spinulosa*: Africa, *Sonnerat* s.n., Herb Lamarck, (lectotype P-LA!). Type of *O. parviflora* = South Africa, Cape b. Spei, *Grubb* s.n. (holotype SBT, sheet 4.3.9.99 web image!), probably collected in April 1764 when Grubb was in the Cape (according to Gunn & Codd 1981).

Othonna denticulata [Dryand] in Aiton (1789: 276); Thunb. (1800: 167; 1823: 719); *synon. fide* Harvey in Harvey & Sonder (1865: 335). Type: Cape of Good Hope, *Masson* s.n. (holotype BM, image!).

The leaves of the type specimen of *Cineraria spinulosa* are obovate to spatulate, minutely dentate, sessile with amplexicaul bases and are pinnately veined. The

many small capitula are ecalyculate with involucre bracts connate for c. 1 mm at the base, and neither ray nor disc cypselae are compressed and they lack a distinct carpodium. It matches *Othonna parviflora* P. J. Bergius, not to be confused with *O. parviflora* L. which is now considered to be synonymous with *O. quinqueidentata* DC. (Nordenstam 1967: 300; Goldblatt & Manning 2000: 350).

Cineraria tomentosa Less. = **Oresbia heterocarpa** Cron & B. Nord. in Cron & Nordenstam (2006: 216–221). Type: South Africa. Western Cape: Waterkloof Gorge, W of Ceres, 30 Sept. 1928, *J. Hutchinson & N. S. Pillans* 576 (holotype K!; isotypes BM!, BOL!, PRE!).

Cineraria viscosa L' Hér. (1788–92: 25 n.2); W. T. Aiton (1813: 75) = ? Type: South Africa, prope Cap. Bonae Spei, *Hort. Kew* 1778 (holotype BM!).

Perennial herb, to c. 0.20 m tall. *Stems* woody, branching, reddish-brown, thickly cobwebby, glabrescent, ridged. Leaves ovate to lyrate, 5–7-lobed, occasionally with lateral pinnae, slightly fleshy, lamina 7–12 × 5–11 mm, finely cobwebby, especially near base of lamina, glabrescent; apex acute; margin coarsely dentate; base decurrent; petiole 12–17 mm long, finely cobwebby, especially near base and in axils; auricles absent. *Capitula* heterogamous, radiate, few per plant, solitary, axillary; peduncles c. 25 mm long, glabrous?, bracteate. *Involucre* ecalyculate, phyllaries 10–12, 4.2–5.0 mm long, glabrous, margins scarious. *Ray florets* possibly 5, c. 9 mm long, limb c. 6.6 mm long, 4-veined. *Disc florets*?, corolla c. 3.5 mm long. *Cypselae* oblong, margined, brown, glabrous. *Pappus* of white bristles.

PHENOLOGY. Flowering time not known.

DISTRIBUTION. South Africa, Cape of Good Hope.

HABITAT. Not known.

CONSERVATION STATUS. Data deficient. Possibly rare as the species is only known from the type collection.

NOTES. Known only from the type specimen which was cultivated at Kew from material collected by Solander from the Cape of Good Hope. This species clearly does not belong in *Cineraria* for the following reasons: its capitulum is ecalyculate; the style apex is truncate (to slightly rounded), as opposed to penicillate or obtuse in *Cineraria*; and although its cypselae appear to be compressed, this is very likely a function of their immaturity. The cypselae are not distinctly margined, nor are they obovate — very diagnostic characters for *Cineraria*. The anther appendage is similar to that seen in *Cineraria* and other *Senecioneae*, however the filament collar is not at all balusterform, indicating that it is not a senecionoid genus.

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